Food and Agriculture Organization of the United Nations

ARAB AND NEAR EAST PLANT PROTECTION BULLETIN

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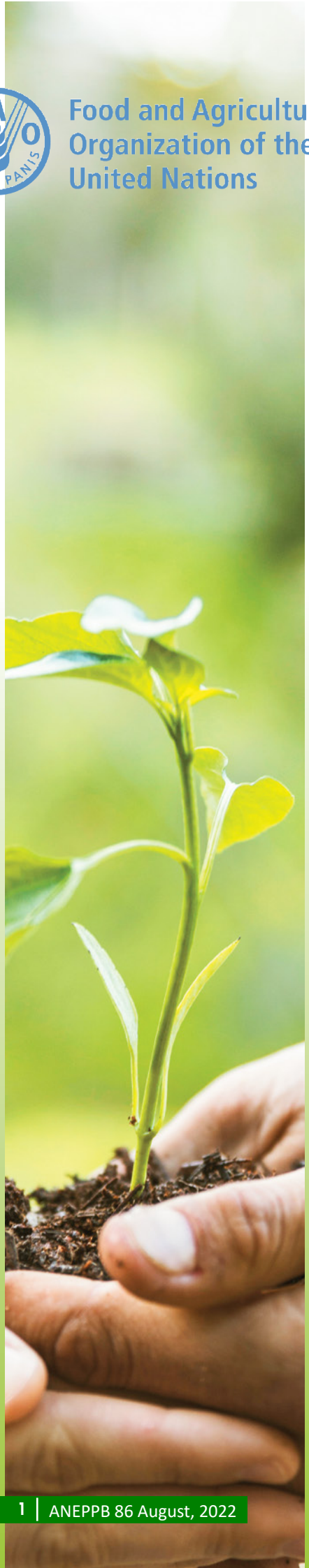

نشـــرة وقايـــة النبـــات في البلدان العربية والشرق الأدنى

ARAB AND NEAR EAST PLANT PROTECTION BULLETIN (ANEPPB)

2022

ARAB AND NEAR EAST PLANT PROTECTION BULLETIN

Food and Agriculture Organization of the United Nations

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

EDITORIAL

Why Attending Conferences Matters: The Case of the Arab Congress of Plant Protection

Since the 13th Arab Congress of Plant Protection (ACPP) in Tunisia is approaching (16-21 October, 2022), the Editor of this bulletin, Dr. Ibrahim Al-Jboory, invited me to write the editorial for the August 2022 issue encouraging scientists to attend this event. I am among the very few who attended all past 12 congresses and planning to attend the 13th ACPP, and as an Arab Society for Plant Protection (ASPP) member who enthusiastically attended conferences for over 50 years, I feel privileged to write something on "Why Attending Conferences Matters".

There is no doubt in my mind that a major activity of a research scientist must be attending professional conferences. It is common knowledge that conferences are a place to present one's research findings. But what are the other benefits of attending a conference on plant protection? I can easily mention a few: (1) they can provide useful information in different directions within plant protection, (2) expose research scientists to new techniques, skills and ideas, (3) can improve scientist's presentation, (4) provide new contacts that with time can improve one's research, (5) provide an opportunity to make vital connections that can lead to new initiatives, papers, and funding opportunities. ASPP congresses are also a way of getting face-to-face interactions with leaders in the plant protection field, and for those who are just starting their career, they are a way to gain valuable advice and mentoring.

Furthermore, inviting well-known plant protection scientists from around the world to contribute to ASPP congresses on issues of regional or global importance will expose congress participants to ideas and initiatives that can enhance their careers. Such interaction can also accelerate the development of regional projects where a number of scientists from different Arab countries work together with international scientists to achieve outputs of significant impact on agriculture in individual countries and the Arab region as a whole. Finally, I should not forget that attending a conference will let participants visit a new place and have fun.

Attending conferences cost money, and many scientists from low-income countries find it difficult to pay for the cost of attendance, especially young ones. Many institutions in the Arab region do not allocate enough resources for this purpose. The Arab Society for Plant Protection found over the years found in the Islamic Development Bank (IDB) a model institution that generously supported the attendance of a number of scientists, especially from low-income countries, to attend ASPP congresses. It is hoped that ASPP, in the coming years, will be able to convince more sponsors to give a helping hand to scientists and assist them in participating in such important events.

Conferences are much more than simply listening to talks. In light of recent evidence that conferences attendees are dropping, their benefits must be re-emphasized to help prevent the inevitable decline that would touch areas such as knowledge sharing, career development and research collaboration.

Khaled Makkouk Beirut, LEBANON

Food and Agriculture Organization of the United Nations

ARAB AND NEAR EAST PLANT PROTECTION BULLETIN

Number 86, August 2022

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INVASIVE, NEW PESTS AND BENEFICIALS

Algeria

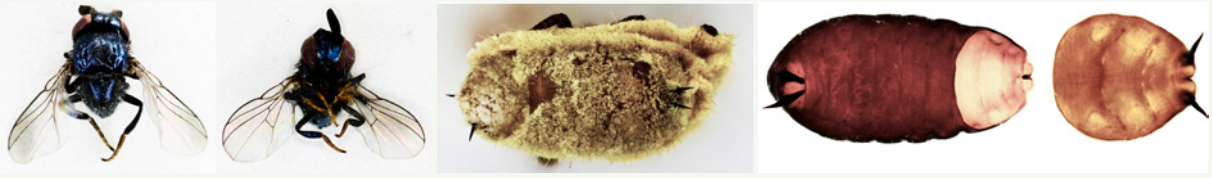
First Report of Fusarium redolens Causing Fusarium Yellows on Chickpea in Algeria

In June 2019, twelve chickpeas (*Cicer arietinum*) fields in the region of Mascara, Northwestern Algeria, showed plants with leaf yellowing or necrosis that started from the bottom shoots and gradually went up (disease incidence of about 75%). Seventy stem tissues from 24 symptomatic plants were surface disinfected and cultured on potato dextrose agar (PDA) at 25 °C. Twenty fungal isolates showed aerial mycelial morphotype on PDA with white to pink pigmentations. Abundant microconidia, mostly single-celled (6.5–9.1×3.3–4.3 µm), and uncommon septate macroconidia (29.2–37.3×3.8–4.2 µm) were observed. Chlamydospores were mostly globose (8.1 µm mean diameter). The cultural and morphological characteristics were similar to *Fusarium redolens* Wollenw. (Leslie and Summerell 2006). The internal transcribed spacer (ITS) and translation elongation factor 1-alpha (TEF-1α) of the representative isolate (FRC) were amplifed, sequenced and deposited in GenBank (accession Nos. ITS: MW519908; TEF1-α: MZ151166) (White et al. 1990; Carbone and Kohn 1999). BLASTn analysis of the obtained sequences showed 99.82% and 100% identities to reference sequences MT446126 (ITS) and MK937112 (TEF1-a) of *F. redolens*, respectively. Phylogenetic analysis of concatenated sequences clustered FRC readily and consistently with reference *F. redolens* strains. The pathogenicity test of FRC was carried on 8-day-old seedlings line ILC482 of chickpea by 1 cm submersion of trimmed roots in a spore suspension (10^6 microconidia/ml). Control plants were immersed in sterile distilled water. All plants were maintained in a greenhouse for 40 days at 25 °C. Up to 100% disease incidence occurred on inoculated plants after 24 days. The symptoms were similar to those observed in the Feld. No signs were observed in the control seedlings. The fungus was re-isolated and identified as *F. redolens,* fulflling Koch's postulates. To our knowledge, this is the first report of *Fusarium redolens* as the causal agent of Fusarium yellows on chickpea in Algeria. **[Souad Zaim and Ahmed Amine Bekkar (Algeria), Laboratory of Research on Biological Systems and Geomatics (L.R.S.B.G), Department of Agronomy, Faculty of Life and Natural Sciences, University of Mustapha Stambouli Mascara, Mascara, Algeria, 2022].**
SouadZaim zaimsouad1528@yahoo.fr; s.zaim@univ-mascara

Jordan

First Record of the Parasitoid *Cryptochetum jorgepastori* (Cadahia, 1984) (Cryptochetidae: Diptera) from Jordan

Cryptochetum jorgepastori (Cryptochetidae: Diptera) is recorded from Jordan for the first time. Adult flies emerged from the giant date palm mealybug, *Pseudaspidoproctus hyphaeniacus* (Hemiptera: Monophlebidae), attacking date palm, *Phoenix dactylifera*, Canary Island date palm, *Phoenix canariensis*, and fan palms, *Washingtonia* sp., in Ghawr Kabid in the central Jordan Valley. The collected specimens were identified according to the original descriptions for the adult (including male and female genitalia) and the operculum of the pupa. Specimens were deposited at the University of Jordan Insects Museum. A survey to confirm the current distribution of *C. jorgepastori* and its hosts in Jordan is needed as well as the study of its biology and ecology and to evaluate its potential role in integrated pest management programmes. **[Ahmad Katbeh Bader[1] and Ibrahim J. Al-Jboory[2], [1]Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan, [2]Department of Plant Protection, College of Agriculture, University of Baghdad, Baghdad, Iraq, 2022].**
DOI: 10.1111/epp.12864



Jordan

First record of the woolly whitefly, *Aleurothrixus floccosus* (Maskell, 1896) (Hemiptera: Aleyrodidae), on citrus fruits in Jordan

About 20 years ago, samples of infested lemon leaves were sent to the University of Jordan Insect Museum. The insect pest was diagnosed as the woolly whitefly, *Aleurothrixus floccosus* (Maskell, 1896) (Hemiptera: Aleyrodidae).The Plant Protection Directorate of the Ministry of Agriculture at that time destroyed the tree and eradicated the infestation. Samples of infested citrus trees were also received from the suburb of Jasmine in Amman in 2019 and were also identified as *A. floccosus*. In July 2022, infested citrus samples were obtained from the Al Salt area and *A. floccosus* was identified. The recent infestation site was visited to examine and investigate the case with a representative of the Department of Plant Protection, Ministry of Agriculture, and the Directorate of Agriculture of Balqa. The pest was found on four citrus trees that were treated with a selective insecticide to conserve the natural enemies seen associated with the insect pest. The observed natural enemies were the predatory ladybird *Clitostethus arcuatus* (Rossi, 1974) (Coleoptera: Coccinellidae), the larvae of the green lacewing, *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae), and the parasitoid wasp *Cales noacki* Haward, 1907 (Hymenoptera: Aphelinidae). The pest status is still under investigation and follow-up with the cooperating owner of the garden.Further investigations are needed to determine the distribution of the insect pest in Jordan, which was already found in nearby countries such as Palestine, Syria, and Lebanon. The origin of the *A. floccosus* is believed to be South America, from which it moved to the Canary Islands in 1959 and migrated to the countries of the Mediterranean basin and most continents of the world. The pest is considered an important one, and it is treated mainly by biological control programs.**[Ahmed Katbeh-Bader, University of Jordan; Ibrahim Al-Jboory, University of Baghdad; Emad Elawad and Mansour Shkairat, Ministry of Agriculture, Directorate of Plant Protection, Jordan August 2022]**




Iraq

New Record of Shot Hole Disease on Apricot in Iraq

Dr. Muhammad Zaidan Khalaf sent some pictures of apricot fruits suspected of being traces of scale insect infestation; clearer pictures were requested for precise identification. The photos were shared with colleagues in Syria and Lebanon, who assured us that the symptoms are of shot hole disease on stone fruits, the most important of which are apricots and peaches. Returning to the scientific archive, Bassam Bayaa mentioned in 1992 that this disease is specific to almonds and spreads in all regions where these trees are planted. In Syria, the disease appears mainly on peach and apricots, as observed on cherries. The disease symptoms appear on the leaves as small reddish or purplish spots, with yellow to bordering brown spots. In the late stages of the disease, these spots appear circular or ribbed that dry quickly, leaving a curvature on the leaf. This symptom is not always related to the presence of the causative fungus *Stigmina carpophila*, as it may be caused by some other fungal and bacterial genera and even viruses with the same symptom. Imad Nahal and Elia Choueiri mentioned that Saad and Nienhaus registered the disease in Lebanon in 1969 on apricots and cherries. It is called leaf scorch disease, where symptoms appear in the form of red spots on the leaves in the spring. The leaves turn red, and the flower clusters fade before the petals open. Small round holes appear on the fruits with the possibility of gummy secretions, ulcers and gummy secretions on the branches and the possibility of the buds dying at the end of the winter and not opening next spring. The fungus remains on the affected twigs and shoots during the winter; the optimum condition for fungus to survive is a temperature of 20 C° (9-27) degrees Celsius and high humidity with the availability of air in the spring. Shot hole disease is considered one of the critical diseases in Turkey, and it affects all local and imported varieties of apricots. The incidence of the disease in Turkey, according to Sarac 2018, reaches 74%. Ahmadpour et al.,2009 indicated that the disease is present in Iran and Azerbaijan and affects almonds, apricots, peaches, plums, and nectarine. The pathogen is the fungus *Stigmina carpophila* (Lev.) M.B. Ellis (Synonym=*Wilsonomyces carpophilus*) . Muhammad Al-Hamdani confirmed, through

personal contact with Zaidan, that the symptoms indicate the presence of the bullet hole disease caused by the fungus *Wilsonomyces carpophilus*, which causes the same symptoms on almond trees. The shot hole disease is not reported in Iraq yet; therefore, this scientific note revealed that it is recorded for the first time in Iraq. The first author presented the case in a lecture at the International Convention for Plant Protection (IPPC) meeting in Tunisia on August 3, 2022. Plant protection authority should stress agricultural quarantine measures following up the shipments entering the Iraqi borders from neighbouring countries. A full container carrying apricots infected with this disease entered Iraq from Turkey. Plant pathologists should study and document the disease as stone fruit pests in Iraq. We sincerely thank Dr Muhammad Qassem (University of Aleppo), Dr Elia Choueiri (LARI-Lebanon), Dr Muhammad Al-Hamdani, consultant USA, and engineer Zinnete Moussa(LARI- Lebanon) for providing us with some scientific archives on the disease**.[Ibrahim Al-Jboory, the University of Baghdad and Mohammad Zaidan Khalaf, Ministry of Sciences and Technology August 2022].**

First Record of the Fungus *Fusarium oxysporum* that Causes Root Rot and Damping off on *Catharanthus roseas* L. in Karbala and Babylon Provinces, Iraq.

This study was conducted to isolate and diagnose the fungus that causes root rot and seedling death of *Catharanthus roseas* L. in some nurseries in the governorates of Karbala and Babil, and to test its pathogenicity in the laboratory and under greenhouse conditions. The results showed that 11 isolates of *Fusarium oxysporum* were phenotypically diagnosed and outperformed. Isolate FK8 significantly lowered the percentage of red radish seeds on the water agar medium, as the percentage of germination in it was 3.33% and the inhibition rate was 96.66% compared to the comparison treatment in which the percentage of seed germination was 100%. The results of the plastic pots experiment in the greenhouse also showed that the results matched the laboratory experiment, as isolate FK8 was significantly superior in reducing the germination rate, which amounted to 13.33%, and an inhibition rate of 86.67% when treating the seeds of *Catharanthus roseas* L. plant with the isolated fungi compared to the comparison treatment, in which the percentage of germination reached 100%. . The results of the molecular diagnosis showed that the most pathogenic isolate FK8 belongs to the fungus *Fusarium oxysporum,* and it was deposited in the American Gene Bank under the entry number on025785. **[Noor A. AL-Ghazali, Rajaa G. Abdalmoohsin, Ahmed B. Abu-Duka (Iraq), Department of Plant Protection, College of Agriculture, University of Kerbala, HIV NURSING, Volume 22; issue 3 August 2022].**

First Record of the fungus *Rhizoctonia solani* that causes Root Rot and Damping off on *Catharanthus roseas* L. in province Kerbala and Babylon / Iraq.

This study was conducted to isolate and diagnose the fungus that causes root rot and seedling death of *Catharanthus roseas* L. in some nurseries in the governorates of Babylon and Karbala and to test its pathogenicity in the laboratory and under greenhouse conditions. The results showed that 30 isolates of the fungus *Rhizoctonia solani* were phenotypically diagnosed. Isolate RK22 significantly outperformed the other isolates in reducing the germination percentage of red radish seeds on Water agar media, as the germination percentage in it was 0.00%, and the rate of inhibition was 100% compared to the comparison treatment in which the percentage of seed germination was 100%. The results of the plastic pots experiment in the greenhouse also showed that the results matched the laboratory experiment, as isolate RK22 was significantly superior in reducing the germination rate, which amounted to 3.33%, and an inhibition rate of 96.67% when treating the seeds of *Catharanthus roseas* plant with the isolated fungi compared to the comparison treatment, in which the percentage of germination reached 100%. . The results of the molecular diagnosis showed that the most pathogenic isolate RK22 belongs to the fungus *Rhizoctonia solani*, and it was deposited in the American Gene Bank under the entry number. **[Noor A. AL-Ghazali, Rajaa G. Abdalmoohsin, Ahmed B. Abu-Duka (Iraq), Department of Plant Protection, College of Agriculture University of Kerbala, HIV NURSING, Volume 22; Issue 3 August,2022].**

Iraq

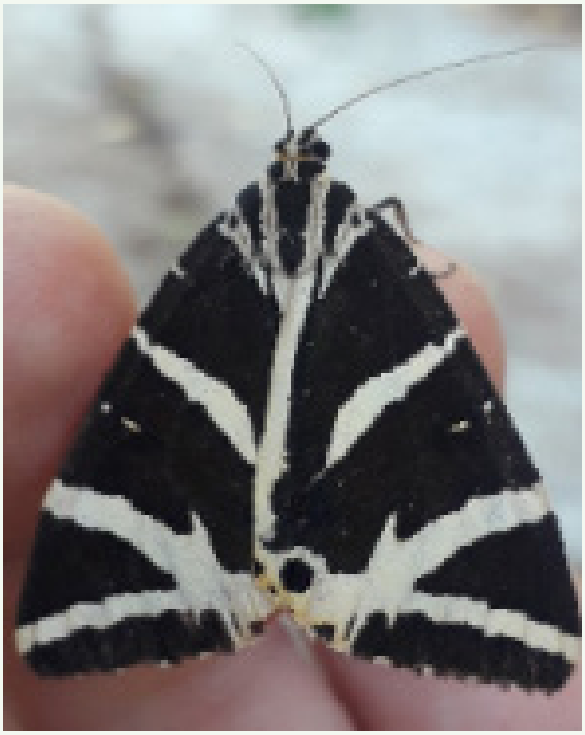
First Report of *Paecilomyces* Rot on Roses (Rosa sp.) in Iraq

In February 2019, severe rot symptoms were seen with 10–20% disease incidence on rose plants (*Rosa* spp.) in nurseries of Karbala Provinces, Iraq. Initially, irregular brown spots occurred at the stem base, which developed to dark-brown discolouration, with water-soaked lesions rapidly expanding to stems and flowers. These symptoms were associated with the appearance of white to light-yellow aerial mycelia, leading to wilting and eventually death. The obtained five fungal isolates initially showed white aerial mycelia on PDA, then turning to yellowish-white or creamy. Conidia were hyaline and ellipsoid to spindle-like, with size 12–17 × 3.2–5.5 µm (*n* = 50). They were smooth walled, single or in short chains, carried by verticillate conidiophores with different whorls of phialides with a cylindrical or swollen base connected to a long and distinctive neck. These characteristics matched *Paecilomyces variotii* (= *Byssochlamys spectabilis*) Bainier (Samson 1974). The internal transcribed spacer (*ITS*) region and actin (*actA*) gene of a representative isolate were sequenced with ITS1-ITS4 and ACT-512F/ACT-783R primers (Lahuf et al. 2020), respectively. The BLASTn analysis of ITS (OL870978) and Actin (OL965123) sequences presented > 99% similarity with *P. variotii* (GenBank accession No. MH٢٧٠٥٥١ and EU٠٣٧٠٢١, respectively). The phylogenetic analysis demonstrated the clustering of the sequences with various *P. variotii* strains. For pathogenicity assays, ١ ml of a conidial suspension (١٠ × ١^{6} conidia/ml) from one-week-old pure cultures of the 5 isolates was sprayed on 10 healthy rose plants (50 plants in total). Whereas 10 control plants were sprayed with distilled water as controls. All plants were incubated at 25 ± 2 °C in humid chambers. After two weeks, the same rot symptoms observed originally developed only on inoculated plants. *P. variotii* was re-isolated and identified to confirm Koch's postulates. *P. variotii* was reported to cause dieback on pistachio trees in Iran (Heidarian et al., 2018). This is the first report of this fungus as a cause of rose rot in Iraq. **[Adnan A. Lahuf., Abeer Q. Kadhim., Zainab L. Hameed., Alaa M. N. Almulla (Iraq), Department of Plant Protection, Agriculture College, University of Kerbala, Karbala, Iraq; Department of Horticulture, Agriculture College, University of Kerbala, Karbala, Iraq; Department of Field Crops, Agriculture College, University of Kerbala, Karbala, Iraq, Journal of Plant Pathology, 2022].** https://doi.org/10.1007/s42161-022-01162-7

Syria

First Record of Jersey Tiger *Euplagia quadripunctaria* (Poda, 1761) (Lepidoptera: Erebidae) in Syria

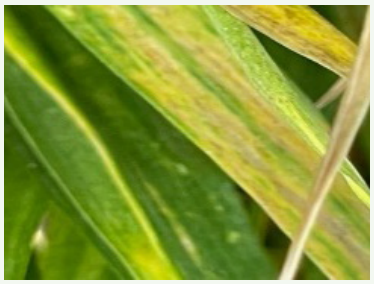
Euplagia quadripunctaria, the Jersey tiger, is a day-flying moth. This butterfly is characterized by black with white stripes on the forewings and red with four black dots on each of the hindwings. Adults have a wingspan of 45-60 mm. The caterpillars also have bright colours and tufts of stinging hairs; They measure between 35 and 38 mm. The chrysalises are black and are found on the ground, among grasses, or under the leaf litter between July and August; they measure about 20 mm. The larvae (caterpillars) are polyphagous, feeding from September to May on nettles (Urtica) and raspberries (Rubus, dandelion (Taraxacum), white deadnettle (Lamium), ground ivy (Glechoma), groundsel (Senecio), plantain (Plantago), borage (Borago), lettuce (Lactuca, and hemp-agrimony (Eupratoria. The insect overwinters as a small larva. **[Abdulnabi Mohamed Basheer, Ali Mohamed Younes, (Syria), Faculty of Agriculture, Damascus University, 2022].**



Syria

First Record of Winter Grain Mite Penthaleus *major* Dugès, 1834 (Acari:Trombidiformes: Penthaleidae) in Syria

A very high population of winter grain mites (Blue Oat Mite) *Penthaleus major* Dugès was recorded in several areas in Hama Governorate, Syria (Al-Ghab, AsSuqaylabiyah, Masyaf, Asilah, and Deir Shmail) in wheat fields *Triticum aestivum* L. In addition, individuals have been collected in the orchards of Abu Jarash in Damascus Governorate. All mite stages were present, including larvae, nymphs, and adults; the mite was recorded during March and April 2022. The length of the body of the adults was (1 mm on average) spherical with a black-purple colour carrying four pairs of legs orange-red in colour. Members of this species are characterized by the sickle-like shape of the chelicerae and the presence of A reddish-orange oval spot on the back that represents the anal plate and the anus of the mite. This mite infests cereal crops, legumes, cotton, and some vegetable crops and could be present in some wild weeds, especially grasses. The symptoms of this pest are the presence of pale spots that turn silvery caused by feeding all the mite's motile stages on the host's leaves. This record is the first for this mite in Syria and the Middle East. **[Mohamad Kanouhº, Majd Jamal[1], Oday Salloum[2], Rasha AlAli[3] (Syria),ºDepartment of Plant Protection, Faculty of Agriculture, Damascus University, Syria. [1]The International Center for Agricultural Research in The Dray Areas-ICARDA-Syria Office.[2]Agriculture Engineer, Hama, Syria.[3]Directorate of Agriculture, Plant protection Protection, Hama, Syria.2022]**


First Record of the Mediterranean Tiger Moth *Cymbalophora pudica* (Esper, 1785) Lepidoptera: Arctiidae.

The adult insect is a butterfly about 13 mm long; the wingspan of *Cymbalophora pudica* is typically 35–42 mm in males and 37–44 mm in females. The background colour of the wings and the shape of their markings are somewhat variable. The external surface of the forewings usually may be milky white or pinkish, with a pattern of black triangular patches. Hindwings vary from white to pinkish with marginal spots. The blackish-haired thorax is characterized by two yellowish longitudinal stripes and a broad, yellowish cervical spine. The antennae of the males are ciliated (hairy), while those of the females are filiform (thread-like). The abdomen is reddish with black spots. Males are capable of emitting sounds from their wings during flight. The caterpillars are gray, gray-browny and covered with black-brown warts on each segment. The insect is found in grassy areas, rocky hills, and low and medium elevations. The larvae feed during the day on herbaceous plants of the family Poaceae. **[Abdulnabi Basheer, Zakaria Al-Nasser (Syria), Damascus University, Faculty of Agriculture, 2022]**

First Record of the Parasitoid *Lissonota setosa* (Gravenhorst, 1829) (Hymenoptera: Ichneumonidae: Banchinae) in Syria.

Lissonota setosa (Geoffroy, 1785) is a parasitoid of the order Hymenoptera, superfamily Ichneumonoidea and family Ichneumonidae, subfamily Banchinae and is the only subfamily of Echneumonoides containing polyichnoviruses (ichnoviruses). The adult is black with orange legs, the length of the adult is 8-9 mm, the front wing is 6.5-7 mm, and the parasitoid has a long Ovipositor. Ovipositor sheath 8-9 mm, 1.26 times longer than the length of the hind wing, and 2.64 times longer than the length of the hind tibia. It is recorded as a specialized parasitoid on stem borer insects (Cossidae). It is recorded in Syria as an internal parasitoid on goat moth larvae *Cossus cossus* (Linnaeus, 1758). **[Abdulnabi Basheer, Huda Kawas (Syria), Department of Plant Protection, College of Agriculture, Damascus University, Syria,2022].**

Syria

First Record of the Lemon Emigrant *Catopsilia pomona* (Fabricius, 1775) along the Syrian Coast

Catopsilia pomona (Fabricius, 1775) (Lepidoptera: Pieridae), called in English Common Emigrant or Lemon Emigrant, the common emigrant or lemon emigrant comes in many forms for both sexes, but generally, they are moderately large with wing upperside appearing in either white or yellow and black-bordered on the costa and termen of the forewing. Wingspan of Adult Butterfly: 50-70mm. The male is distinguished by the color of the front wings green and on the edge of the wing, there is a blue stripe; on the base of the front and hind wings there is an area of sulfur yellow, the colour of the wings of the female is yellow with a rim and black spots. The insect spreads in nature reserves, urban parks, wastelands, and residential buildings. The insects are distinguished by their visit to the colourful flowers. Eggs are laid singly on the upper surface of the leaves of the host plant. The newly emerging larva is about 2-2.2 mm long, creamy white with a yellow tint, and the head capsule is white. The larva is characterized by the presence of longitudinal rows of relatively small tubercles bearing hairs, in later stages, the colour changes to yellowish-green, the larva has five instars, and the length of the larva is fully grown 47 mm. The fully-grown larva stops feeding, is located on the lower part of the stem of the host plant, spins a cocoon to enter the pupal stage, and spins a cocoon to enter the pupal stage, the length of the cocoon is 28-28 mm. **[Abdulnabi Basheer, Mohamad Kanouh (Syria), Department of Plant Protection, Faculty of Agriculture, Damascus University, Syria, 2022].**

First Record of the Parasitoid *Anomalon cruentatum* (Geoffroy, 1785) (Hymenoptera: Ichneumonoidea: Ichneumonidae: Anomaloninae) in Syria

Anomalon cruentatum can reach a body length of 10–14 mm, while the front wings reach 2.8–3.8 mm. The body is mainly black in males, while in females head and thorax are reddish (hence the species name cruentatum, meaning bloody). The abdomen is slender, and the propodeum is reticulated. The clypeus is rounded at the apex. The clypeus is rounded at the apex. Antennae are black. Legs are yellowish brown, with a white on the base of the hind tibia. These wasps are koinobiont endoparasitoids of larvae of Tenebrionidae or moths in the superfamily Noctuoidea .Reported host species are *Agrotis ipsilon*, *Cerura palestinensis*, (Lepidoptera: Noctuidae), *Gonocephalum rusticum* (Olivier, 1811), (Coleoptera:Tenebrionidae) and *Ptilodon capucina* (Linnaeus, 1758), (Lepidoptera: Noctuoidea:Notodontidae). **[Abdulnabi Basheer, Huda Kawas (Syria), Department of Plant Protection, College of Agriculture, Damascus University, Syria, 2022].**

RESEARCH HIGHLIGHTS

Iraq

Detection of the Causal Agent of Chickpea Root and Crown Rot Disease and its Biological Control. The aim of the research was to diagnose the causal agent of chickpea root and crown rot disease in the fields of Nineveh and Duhok governorates and to evaluate its pathogenicity and control it using bacterial isolates *Azotobacter chroococcur* (Ac), *Bacillus cereus* (Bc) and *B. pumilus* (Bp). *Rhizoctonia solani* was the most prominent fungus in the samples, with an incidence 80.5% and a frequency percentage of 61.2%, as 71 isolates of the fungus were diagnosed based on morphological characteristics, 57 of them only positively interacted with the primers used in the technique of polymerase chain reaction (PCR), 58% of the isolates belong to the anastomosis group AG 3, isolate RSN- 33 was more virulent than the rest of the isolates as it completely prevented seed germination compared to the control treatment. The 66 bacterial isolates were isolated from the rhizosphere of intact chickpea plants. BN13 and BN27 isolates showed 100% inhibition of the pathogen on potato dextrose agar (PDA), and the diagnostic results showed that they belong to *Bacillus cereus* and *B. pumilus*, which are beneficial bacteria in the soil. Under the greenhouse conditions, the triple treatment Bc+Bp+Ac excelled in controlling chickpea root and crown rot disease, as the seed germination percentage reached 100% compared to the negative control treatment (the fungus alone) (60%), and the disease percentage and severity was 12.7 and 6.3% respectively, compared to the negative control which was 95.0 and 77.0% respectively. The triple treatment also increased the plant growth indicators represented by dry weight (16.5 g / plan) compared to the negative and positive control (2.9 and 10.7 g / plant, respectively). **[Safaa N. Hussein (Iraq), Department of Environmental Engineering, College of Engineering, University of Mustansiriyah, Iraq, Indian Journal of Ecology, 49 Special Issue (18): 602-609, 2022].**
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Taxonomic Study of The Wild Bee's Genera in Basrah Province - Southern Iraq. The study included a survey of six geographical locations in Basra province, Southern Iraq: the Shatt al-Arab, Al-Hartha, Abu Al-Khasib, Al-Zubeyr, Al-Faw, and Qurna regions for the period from 1/2/2018 to 1/11/2019. To study the presence of wild bees, the taxonomic study showed samples collected for the diagnosis of 7 species or morphospecies, traced to four genera (Ceratina, Andrena, Megachile, and Icteranthidium) and belonged to four tribes, three subfamily, and three families. It is less than was recorded in the old years. **[Muslim, A. Al-Etby, Iyad, A. Abdel-Qader and Labeed, A. Al-Saad (Iraq), [1] Department of Plant Protection, College of Agriculture, University of Basrah, Al- Basrah, Iraq, Syrian Journal of Agricultural Research –SJAR 9(2): 358-374 April 2022].**

Laboratory Evaluation of Inhibition Efficiency of Some Bacteria Isolated from Greenhouse Soils on the Growth of the Pathogenic Fungus *Sclerotinia sclerotiorum* that Causes White Rot Disease on Vegetables. This study aimed to isolate beneficial bacteria from the soil of plastic houses planted with eggplant and cucumber at different locations of Baghdad Governorate and characterize them molecularly in addition to determining their antagonistic ability to inhibit six isolates of the pathogenic fungus *Sclerotinia sclerotiorum,* the causal agent of white rot disease. The isolation results showed that 18 different bacterial isolates were obtained from several fields in Baghdad governorate. Bacterial isolates showed antagonistic ability towards six isolates of the pathogenic fungus *S. sclerotiorum* (ScE1, ScE2, ScE3, ScE4, ScC1 and ScC2), and the inhibition rate ranged between 84.25 and 93.75%. The two bacterial isolates BE1 and BE6 excelled in plastic houses grown with eggplant plants, and the inhibition rate of the fungal pathogen reached 93.75%. In contrast, the bacterial isolate BC9 from soils planted with cucumber plants achieved the highest inhibition rate of all fungal isolates, except isolate ScE1, which reached 84.25%. Bacterial isolates were identified molecularly and were registered in the GenBank under accession numbers MZ436922, MZ436923, MZ436921, and MZ436920 for the isolates of *Alcaligenes faecalis, Bacillus amyloliquefaciens, Bacillus subtilis, and Pseudomonas aeruginosa,* respectively.**[Al-Kubaisy, A.K.A. and H.H. Al-Juboori (Iraq), Arab Journal of Plant Protection,40(2):140-147,2022].** https://doi.org/10.22268/AJPP-40.2.140147

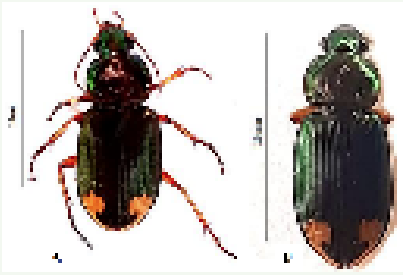
Toxicity Stress of the Durah Power Plant Ash and its Effect on the Alga *Chlorococcum humicola* (Naeg) Rabenhorst 1868. This study illustrates the acute toxic effect of ash released from Durah power plant (DPP) on the biology of the phytoplankton species *Chlorococcum humicola* in Iraq. The results showed that the median lethal concentration for killing 50% of the Alga population (LC_{50}) was 0.15 and 0.13 ppt (parts per thousand) for 24 and 48 hours of exposure to crude ash concentrations, respectively. In contrast, no LC_{50} value was recorded for 72 and 96 hrs after exposure. The reduction in the optical density absorption value and the growth rate recorded was 0.083±0.121 cells for the highest ash concentration, compared with 0.594±0.099 cells recorded for the control group. On the other hand, the doubling time for the control group was 1.16±0.652 an hour compared with 1.36±0.981 an hour recorded for 2 ppt ash exposure. The current study confirms that the crude ash concentrations tested had an adverse toxic effect on the biological parameters of the algal species *Chlorococcum humicola* in Iraq. **[Al-Naymi, N.A.Sh., H.A.S. AL-Nuaimi and M.R. Nashaat (Iraq), Arab Journal of Plant Protection, 40(2): 188-192,2022].** https://doi.org/10.22268/AJPP-040.2.188192

Biological Resistance to *Okra yellow vein mosaic virus* Using Three Biological Agents on Three Okra Cultivars. A study was conducted in Al-Alam District, Salah Al-Din Governorate, Iraq, during the fall season 2019-2020, with the goal of diagnosing the local isolate of Okra yellow vein mosaic virus (OYVMV) from infected plants using polymerase chain reaction. A genomic segment of OYVMV with a size of 750 was amplified using polymerase chain reaction (PCR) and a set of specific primers. By amplifying a 750 bp band on agarose gel, the field isolate tested was identified as a member of the genus Begomovirus, which was related to an Indian isolate of the same virus. The study included determining the efficacy of three biological factors: (A) a medicinal plant preparation from *A. Paniculara*, (H) a preparation from Lion's mushroom *(H. erinaceus* and (P) a preparation from *P. florescence* bacteria which has an impact on virus infection, as well as determining the response of three okra varieties to virus infection. The use of the three combined factors (A+H+P) outperformed other treatments reducing the virus infection rate of the Petra okra variety to 26.67 % and severity to 10.66 % as compared to 100% for the control. The findings showed substantial variation in the peroxidase enzyme activity and chlorophyll content, with the A+H+P treatment producing 59.14 units/mg protein for the Petra variety and 40.81 Spad for the Hasnawi variety. The results also showed highly significant differences in yield, with the triple treatment (A+H+P) yielding 833.96 gm/plant for the Star variety compared to 537.44 gm/plant for the infected control that was not treated. **[Jadoua, J.A. and M.A.W. Al-Fahd.(Iraq), Arab Journal of Plant Protection, 40(2): 148-157,2022].**
https://doi.org/10.22268/AJPP-40.2.148157

The Efficiency of *Aloe vera* Gel Extract in Inhibiting the Growth of *Aspergillus flavus* Fungus Associated with Imported and Domestic Rice Grains in Iraq and its Ability to Reduce Aflatoxin B1 Production. The study aimed to evaluate the efficiency of different concentrations of *Aloe vera* gel extract in inhibiting the growth of *A. flavus* on potato dextrose agar (PDA) culture medium, as well as evaluating the efficiency of the extract in inhibiting the growth of *A. flavus* and reducing Aflatoxin B1 (AFB1) production in rice grains. The results showed that the concentrations 1, 2, 3, and 4% of *Aloe vera* gel extract caused variable inhibition rates of *A. flavus* growth on PDA culture medium; of 97, 100, 5.88 and 17.64%, respectively. The best concentration from the laboratory experiment (2%) was used to evaluate its efficiency in inhibiting the growth of *A. flavus* on rice grains during storage and reduced AFB1 production by 86.5%, from 21.2 ppb in control to 2.86 ppb in the treatment using HPLC high-performance liquid chromatography. The same treatment reduced AFB1 concentration in rice grains contaminated with AFB1 by 74.7%, from 22.88 ppb in control to 5.78 ppb in the extract treatment. **[Al-Hamiri, K.A.A. and H.Z. Hussein. (Iraq), Arab Journal of Plant Protection, 40(2): 164-168, 2022].** https://doi.org/10.22268/AJPP-040.2.164168

A New Procedure to Identify Plant RNA Viruses Associated with the Whitefly *Bemisia tabaci* Using Next-Generation Sequencing.
Next-generation sequencing (NGS) was applied to obtain the transcriptome data of the Iraqi whitefly (*Bemisia tabaci*) that was analyzed using specific bioinformatic tools and programs to identify the accompanying plant RNA viruses. Seven different plant viruses were detected: *Alfalfa mosaic virus* (AMV), *Pittosporum cryptic virus-1* (PiCV1), *Grapevine leafroll-associated virus* (GLRaV), *Broad bean wilt virus* (BBWV), and *Zantedeschia mild mosaic virus* (ZaMMV), in addition to Tomato spotted wilt virus (TSWV). The highest number of viruses identified were AMV, BBWV, and ZaMMV, respectively, through the achievement of the highest viral sequence coverages. In this study, we report a new NGS-based procedure, which facilitates prompt and precise identification and quantification of plant viruses in a pool of *B. tabaci* insect samples without the necessity for specific primers and application of the conventional PCR technique. The benefit of this method is the quick detection of the potential viruses transmitted by the whitefly, *B. tabaci* vector that affects countless plant hosts. However, Additional examinations are required to confirm these findings. **[Salman, M.D. and A.A. Lahuf (Iraq), Arab Journal of Plant Protection, 40(2): 169-174, 2022].** https://doi.org/10.22268/AJPP-040.2.169174

Revision of the Genus *Chlaenius* Bonelli, 1810 (Coleoptera, Carabidae), with A New Record Species from Iraq. In this paper, the species of the genus of *Chlaenius Bonelli*, 1810 (Coleoptera, Carabidae) were reviewed, and it was revealed that there are 21 confirmed species in Iraq; among them, the species of *Chlaenius hamifer* Chaudoir, 1856 was recorded for the first time in Iraq. Diagnostic characters, a redescription of some morphological features, photographs, and illustrations are provided for the new record species in this investigation. **[Amal Hussein Abdullah and Radhi F. Al-Jassany (Iraq), Department of Plant Protection, College of Agriculture Engineering Sciences, University of Baghdad, Baghdad, Iraq. Bull. Iraq nat. Hist. Mus., 17(1): 33-48, 2022].** https://doi.org/10.26842/binhm.7.2022.17.1.0033



Morocco

Effect of *Rhizophagus irregularis* on Growth of Saffron (*Crocus sativus* L.) in Eastern Morocco. Arbuscular mycorrhizal fungi (AMF) form mutualistic relationships with plant roots and can act as bio-fertilizers In the same perspective; a study was conducted to investigate the possibility of a possible constitutive association of the arbuscular mycorrhizal fungus *Rhizophagus irregularis* L. (previously named *Glomus intraradices*) with saffron. The trial was conducted in the field at the experimental station of the Faculty of Sciences of Oujda (Morocco) by applying three doses of *R.irregularis* inoculum: 2, 4, and 6 ml per corm (T1, T2 and T3 treatments). Six months after planting, morphological, biochemical and mycorrhization parameters were measured. The results showed that the inoculation of saffron roots by *R. irregularis* was successful, which induced a significant increase in the number of leaves, the weight of stigmas, and the percentage of daughter corms with large diameters. Similarly, the total chlorophyll content was increased, and the highest value was recorded for the T3 treatment in April (0.04 mg/g MF), with an increase of 25% compared to the control. **[Rimani, M., I. Mzabri, K. Charif, Z. Chafik and E. Kharmach.(Morocco), Arab Journal of Plant Protection, 40(2): 182-187, 2022].** https://doi.org/10.22268/AJPP-040.2.182187

Syria

Survey and Identification of Some Eulophid Parasitoids (Hymenoptera) of Tomato Leaf Miner (*Tuta absoluta*) (Lepidoptera: Gelechiidae) along the Syrian Coast. The Eulophid (Hymenoptera: Chalcidoidea) parasitoids of the tomato leaf miner (*Tuta absoluta*) were collected from tomato fields in Latakia and Tartus provinces of Syria during the period 2019-2020. The collected parasitoids were identified to subfamilies, genera, and species and found to belong to three subfamilies: Tetrastichinae, Entedoninae, Eulophinae, and 5 Genera and 14 species: *Stenomesius japonicas,* 3 species from the genus *Stenomesius*, *Hemiptarsenus unguicellus, Pnigalio agraules,* and 6 species from the genus *Pnigalio*, *Neochrysocharis formosa* and one species from the genus *Elasmus*. *Stenomesius japonicas* and three species of the genus *Stenomesius, Hemiptarsenus unguicellus, Pnigalio agraules,* and *Neochrysocharis formosa* were recorded for the first time in Syria on tomato leaf miner (*Tuta absoluta*) on tomato plants. The most widely spread of these species was *N. formosa* (46.9%) and *S. japonicus* and 3 species from genus *Stenomesius* (45.7%), followed by 6 species from genus *Pnigalio* (4.35%), *Elasmus* sp. (1.37%), *P. agraules* (0.69%), and *H. unguicellus* (0.46%). **[Abo Kaf, N., R. Youssef and R. Aboud (Syria), Arab Journal of Plant Protection, 40(2): 127-139, 2022].**
https://doi.org/10.22268/AJPP-40.2.127139

Occurrence of the Hyperparasite *Ampelomyces quisqualis* on *Golovinomyces neosalviae* (Erysiphaceae), Causal Agent of Powdery Mildew on Common Sage (*Salvia officinalis*). *Ampelomyces quisqualis*, the oldest mycoparasite of powdery mildew (PM), has been widely studied due to its potential in biocontrol. Many strains of this hyperparasite have been experimented worldwide; some were successfully applied for biocontrol, but others have been less efficient. No previous identification of *Ampelomyces* strains has been done in Syria, but some isolates were morphologically identified in the coastal region. There was no indication of *Ampelomyces* occurrence in any other location in Syria. During this three years survey (2019–2021), 73 plant samples were collected from five governorates, including coastal and southern regions in Syria. *Ampelomyces* pycnidia were detected in five samples from the coastal area and a new unpredictable finding of *Ampelomyces* sp. was found in south Syria. This new occurrence of *Ampelomyces* isolate (S.ham82) is documented on a new mycohost; *Golovinomyces neosalviae*, the causal agent of PM on common sage (*Salvia officinalis*). Successful isolation of S.ham82 on PDA was conducted, and parasitic activity was assessed by artificial inoculation using *In vitro* detached leaf assay. Morphological characteristics of this isolate were determined and compared with isolate Bah1 from the coastal region. *Ampelomyces* sp. (S.ham82) pycnidia size were 77.44 (±17.16) x 25.28 (±6.12) µm in the natural host, 125.27 (±42.34) x 115.95 (±40.14) µm, 189.51 (±60.06) x 167.64 (±52.41) µm on PDA media pre and post artificial inoculation, respectively, and 88.24 (±20.05) x 27.98 (±5.68) µm on inoculated detached leaves. Conidia were also morphologically characterized and measured 8.11 (±0.87) x 3.88 (±0.51) µm in the natural host, 8.86 (±1.65) x 3.18 (±0.80) µm in PDA pre and post-artificial inoculation, respectively, and 7.82 (±0.69) x 3.61 (±0.37) µm in inoculated detached leaves. To our knowledge, this is the first report of the natural occurrence of *Ampelomyces* sp. in *G. neosalviae* on *Saliva officinalis*. **[Hamzeh, S., W. Naffaa and M.F. Azmeh (Syria), Arab Journal of Plant Protection, 40(2): 158-163, 2022]**. https://doi.org/10.22268/AJPP-040.2.158163

Morphological and Molecular Characterization of *Fusarium chlamydosporum*, *F. brachygibbosum* and *F. flocciferum* Associated with Crown and Root Rot of Wheat. *Fusarium* is one of the most important genera of fungi, causing plant, animal, and human diseases and producing mycotoxins. A total of 105 isolates of *Fusarium* spp. were recovered from crowns and roots of wheat plants, showing typical symptoms, collected from four Syrian provinces during 2017-2018. In previous studies, seventeen Fusarium species associated with crown and root rot (FCR) on wheat were identified in Syria. However, the identity of some isolates has not been resolved. The current study was carried out to identify and characterize through morphological approaches and sequencing a partial translation elongation factor 1-alpha (*TEF1*-α) gene in three *Fusarium* species *F. chlamydosporum* Wollenweber & Reinking, *F. brachygibbosum* Padwick and *F. flocciferum* Corda associated with FCR, isolated and identified for the first time in Syria. The present study will provide detailed cultural and morphological characteristics of the three species, scarcely described in the literature. **[Zidan, L., D. Jawdat and W. Naffaa (Syria), Arab Journal of Plant Protection, 40(2): 175-181, 2022].**
https://doi.org/10.22268/AJPP-040.2.175181

Tunisia

Behavior of New Entries and Developed Tomato Hybrids Carrying *Ty-2* Gene. Tomato yellow leaf curl disease (TYLCD) is a serious problem hampering tomato production worldwide. In the Mediterranean Basin, disease incidence and severity are higher in the dry season, increasing whitefly (*Bemisia tabaci*) populations. The effectiveness of resistance to *Tomato yellow leaf curl virus* (TYLCV) depends on both tomato host resistance and TYLCV complex species. So far, six different *Ty* tomato resistance genes have been identified. Two main TYLCV complex species, *Tomato yellow leaf curl virus-Israel* (TYLCV-Is) and *Tomato yellow leaf curl Sardinia virus* (TYLCSV), have been identified in Tunisia. The present work aimed to evaluate entries heterozygous for *Ty-2* gene to help predict hybrid performance. Two tomato entries homozygous for the *Ty-2* TYLCV resistance gene, one tomato hybrid homozygous for *Ty-2* and two heterozygous hybrids were included, besides two susceptible tomato entries. Resistance response to TYLCD was recorded based on disease incidence and severity levels. Data analysis was performed according to presence/absence of *Ty-2* gene and taking into account homozygosity and heterozygosity of *Ty-2*. Generalized linear model analysis was applied to check significance of individual factors' effects (*i.e.,* the effect of tomato entries or tomato groups of entries based on presence or absence of homozygous/heterozygous *Ty-2* gene, block unit within the field trial and the year of the trial) on the dependent variables (disease incidence and severity). Further multi-comparison tests gave evidence of the significant effect of *Ty-2* homozygous gene tomato entries on TYLCD incidence and severity levels. The results were discussed with a particular focus on the appropriate use of heterozygous hybrid tomato varieties. **[Elbaz, M., Timoumi, M., and Hanson, P, (Tunisia/Benin), Tunisian Journal of Plant Protection 17 (1): 1-14, 2022].** https://doi.org/10.52543/tjpp.17.1.1

Assessing the Insecticidal Impact of Rosemary Essential Oils on the Saw-toothed Grain Beetle *Oryzeaphilus surinamensis*. This work studied the fumigant toxicity of free and encapsulated rosemary (*Rosmarinus officinalis*) essential oils against adults of the saw-toothed grain beetle (*Oryzeaphilus surinamensis*) for three storage periods: 30, 45, and 60 days. Chitosan was used as an encapsulation matrix. GC/MS analysis results showed that camphor and 1,8-cineole were the major components with respectively 18.04% and 39.67%. Mortality rates caused by the essential oils at 300 µL/L air after 10 days of storage were about 85.48%. The median lethal concentration (LC_{50}) was 124.80 µL/ L air. Encapsulation efficacy was 25.8% and loading capacity was 1.9%. Encapsulated essential oils achieved an efficacy of 82%, 100% and 100%, respectively after 30, 45 and 60 days of storage. Reference treatment with Phosphine revealed toxicity of 100%, 96% and 71% after 30, 45 and 60 days of storage, respectively. Results showed that encapsulated essential oils caused a very slight modification of semolina properties. Protein contents decreased at the end of the storage period by less than 1% (from 13.61% after 30 days to 12.91% after 60 days of storage). Encapsulated essential oils might be considered as an alternative fumigant control way for semolina without deterioration of its quality during storage. **[Soltani, A., Haouel-Hamdi, S., Ajmi, I., Ben Abada, M., Djebbi, T., Chargui, H., Mathlouthi, I., Laabidi, A., Mahmoudi, H., and Mediouni-Ben Jemâa, J. (Tunisia), Tunisian Journal of Plant Protection 17 (1): 15-28, 2022].** https://doi.org/10.52543/tjpp.17.1.2

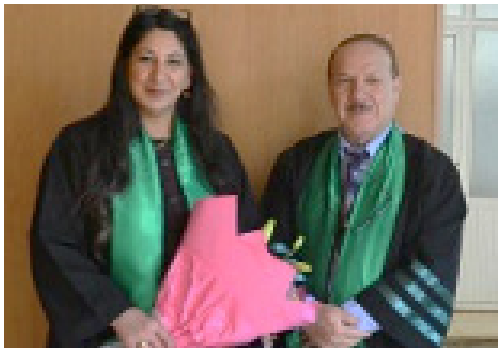
Repellency and Insecticidal Activities of *Thapsia garganica* Crude Extract Against Some Important Pests. Repellency and insecticidal activities of *Thapsia garganica* leaf methanolic extract were investigated against *Tribolium castaneum*, *Myzus persicae*, *Phthorimaea operculella*, and *Spodoptera littoralis*. Repellency and toxic activities (by ingestion and topical application) were evaluated on *T. castaneum* nymphs and adults. Topical application treatment caused total larval growth inhibition at 10%, until mortality after 7 days. The highest mortality was recorded with 94% at the same concentration. Methanolic extracts incorporated into *T. castaneum* larvae artificial diet at 10% caused 100% mortality after 3 days. The extract at 1% caused a high repellent effect on *T. castaneum* after 60 min of exposure, while *M. persicae* was less sensitive. *P. operculella* female's showed sensitivity by a repellent effect at oviposition. Egg's number laid on treated tubers at 1% and 2% decreased significantly to 32% and 72%, respectively. In addition, methanolic extracts had a preventive effect on *P. operculella* larval penetration. The number of larvae was reduced by 30.46% and 76.12% in the treated tubers at 1% and 2%, respectively. For *S. littoralis*, a low antifeeding effect was recorded. However, the relative growth rate (RGR), conversion of ingested and digested food to biomass, were decreased. The approximate digestibility increased. Moreover, a delay in larval development was observed. This study suggests that the leaf extract of *T. garganica* could be applied as a bio-insecticide. **[Jmii, G., Haouala, R., Gharsallaoui, S., Chaieb, I., and Laarif, A. (Tunisia), Tunisian Journal of Plant Protection 17 (1): 29-42, 2022].** https://doi.org/10.52543/tjpp.17.1.3

Graduate Students Thesis (M. Sc. and Ph. D.)

Studies on Some Vegetable Crops Mite Species

Vegetables are called protective foods since they protect humans from a variety of diseases and help to provide a well-balanced diet, including enough energy, vitamins, minerals, fat, fiber and protein. The aim of this study is to shed light on the average numbers of phytophagous mites inhabiting eggplant, chili pepper, common bean, and tomato, in addition to studying the soil mites under these crops in greenhouse and open field conditions. Aiming to offer an alternative method to be used for its control and evaluate the effect of salicylic acid on induced resistance in bean seedlings against spider mite attack. Possible defense responses that were involved were also elucidated, and evaluate the impact of neem oil extract against different stage of *Tetranychus urticae* under laboratory conditions. The present work has been devoted to studying the following: Mites associated with four vegetable crops: Eggplants, *Solanum melongena* (Var. Patra), Chili pepper, *Capsicum annuum,* (Var. Habiba), Tomato, *Solanum lycopersicum,* (Var. Nancy RZ) and common kidney bean, *Phaseolus vulgaris* (Var. Paulista). Soil mites under the vegetable crops in the greenhouse and open field conditions. Evaluate the effect of neem extract against the different stages of *Tetranychus urticae* under laboratory conditions. Evaluate the impact of salicylic acid on induced resistance in bean seedlings against spider mite attacks and possible defense responses. **[Nashwa Abd Elmonem Hamed El Morshdey (Egypt), Department Applied Entomology and Zoology, Faculty of Agriculture, Alexandria University, Egypt, Advisors Committee: Prof. Samia Mohamed Saleh, Prof. Hussien Abdalla Rezk and Prof. Anar AbdAllah Bakr, (Doctorate, 2022)].**

Physiological and Molecular Characterization of *Ascochyta Rabiei* Races on Chickpea and Their Incidence in Iraqi Kurdistan Region



Chickpea (*Cicer arietinum* L.) is a major cool-season food legume in many parts of the world, including Iraq, particularly in Kurdistan. The crop is characterized by low productivity due to some abiotic and biotic factors on both spring and winter season production. Ascochyta blight disease (ABD) incited by *Ascochyta rabiei* is the main biotic constraint of chickpea (Teleomorph: *Didymella rabiei*). Some AB-resistant chickpea cultivars become susceptible as a result of the appearance of high virulent/aggressive *A. rabiei* races. In many countries breakdown of resistance in chickpea cultivars is the greatest challenge to chickpea breeding for ABD resistance. There have been few studies to determine the factors contributing to the emergence of new virulent/aggressive Ascochyta races. The presence of sexual reproduction in pathogen populations is one of the evolutionary forces leading to the development of new races. The current study was conducted between 2017 and 2020 to determine the incidence and geographical distribution of ABD in various chickpea production area across IKR, as well as to isolate and identify *A. rabiei* races on phenotype and genotype bases, also to determine the genetic diversity among the detected isolates in Kurdistan region. The most important results of the study's findings can be summarized as follows: a disease survey in the main chickpea production area's across IKR revealed that the disease was present 59% of the fields. Kalar had the highest disease incidence and severity (100%) followed by Said Sadeq. Fifty-one *A. rabiei* isolates were isolated from infected chickpeas samples collected from 141 infected fields in 29 district across four provinces in IKR. Based on macroscopic and microscopic criteria, significant differences in morphological characteristics were found among the tested isolates on various media. The isolates were divided into six groups based on colony colors, which ranged from light brown to blackish brown on CSMDA, five groups based on mycelium colors ranged from grayish white to creamy aspect, and three groups based on pycnidia color, which ranged from brown to blackish brown. On OMA, the colony color of the isolates was grouped into four groups ranging from greenish white to brown, two groups based on mycelium colors (creamy to white buff), and pycnidial colors were brown to dark brown, whereas, on PDA, colony colors were divided into three groups ranging from greenish white to black, myce-

lium colors were divided into three groups ranging from creamy aspect to beige, and pycnidial color ranged from dark brown to black, these criteria also greatly varied on others media. The isolates mycelial growth rate on CSMDA (7.35cm) significantly outperformed all other media, followed by OMA, with the lowest growth observed on MAC (2.67cm). Isolate AS-28 significantly surpassed all other isolates in mean colony diameter despite the used media followed by isolate AS-11.

While, isolate AS-27 had the lowest colony diameter (5.16cm). *A. rabiei* isolates exhibited varying radial mycelial growth at temperatures range from 15 to 35°C, with the maximum growth observed on 25°C (7.35cm) and the growth stopped at 35°C. The mean conidia and pycnedia dimensions of the isolates ranged from 20.0*7.5µm and 70.8*47.9µm in isolates AS-19 and AS-9, respectively, to 21.8*9.0µm and 140.7*93.6µm in AS-11 and AS-18. Isolate AS-18 gave the largest size (20565µm) while AS-9 had the smallest size (4143.5µm) on CSMDA, OMA and PDA. *A. rabiei* isolates were classified into four groups and 15 physiological races based on their virulence on a set of 10 chickpea differential. Race 1 characterized by its high aggressiveness and showed virulence's against all the tested differentials, while other races explored variable virulence spectrum, and Race 15 was virulent. Race 1 and Race 4 were each represented by five isolates. Pathogen diversity was high in Sulaimani, with nine different races accounting for 60% of the races, followed by Erbil, which had five races accounting for 33% of the isolates. Halabja and Garmian each contributed three and two races, accounting for 20% and 12%, respectively. Chickpea genotypes were divided into three groups: Susceptible group, including genotypes FLIP09-361C (54.3%), ILC263 (53.2%), FLIP09-229C, FLIP09-388C, FLIP09-384C, and FLIP09-248C, Moderately Susceptible group including genotypes FLIP07-197C, FLIP09-222C and FLIP07-228C, and Tolerant group including Ghab 3 only which significantly surpassed all other genotypes.

High genetic diversity were detected among *A. rabiei* isolates from different chickpea growing areas. Genetic variability and relationships among thirty-four *A. rabiei* isolate studied in RAPD, ISSR, SSR, and ERIC analyses to identify the potential primers that produce a high number of polymorphic and repeatable fragments. The primers produced a total of 299 bands ranged from (3-29) with an average of 12.46 bands per isolate; 87 bands were common in all the tested isolates, while the rest 212 bands were polymorphic with 70.90%. The primers OPD-18 (RAPD), ArA06T (SSR) and BA8 (ISSR) revealed the highest polymorphism on a set of 34 isolates and produced a maximum number of polymorphic bands (13 bands), while BA5 produced the minimum number of single bands (2). PIC values ranged from 0.16 (BA5) to 0.96 (BA11) with a moderate mean value of 0.74 for all the loci indicating the high discriminatory power of the 24 markers, BA11 considered being the most powerful primer since it gave the highest PIC value (0.96) and highest genetic diversity (0.96) and worked on 29 alleles. Genetic diversity within *A. rabiei* population ranged from 0.16 to 0.96 with a mean of 0.76. The mean allele frequency was 0.37. Genetic distance among the isolates ranged from 0.14 to 0.55. The dendrogram shows that isolates 33 and 34 collected from Sharbazher have the lowest dissimilarity (0.14) while isolates 2 and 32 collected from Kharaba and Bakrajo have the highest dissimilarity (0.55). The isolates were grouped into six major clusters (C1 to C6) according to UPGMA analysis performed with 24 markers using Jaccard's similarity coefficient with mean dissimilarity of (0.35); cluster six is the largest one consisting of 16 isolates, cluster 2 with thirteen isolates, cluster 1 contain 2 isolates while cluster 3, 4 and 5 each contain one isolate. According to genetic STRUCTURE analysis, all the genotypes were divided into two groups in RAPD, ISSR, SSR and ERIC markers.

The multiplex PCR easily differentiated the pathogen into two mating types and revealed that both mating types exist in the pathogen population affecting planted chickpea. MAT 1-2 isolates were more common than MAT1-1 isolates in IKR chickpea growing area. 54.29% of the isolates were identified as MAT1-2, while 45.71% were identified as MAT1-1. Both mating types were present in an equal ratio in Sulaimani and Garmian, while mating type 1-2 isolates were 75% and 57% more prevalent in Halabja and Erbil, respectively. Identification of the isolates was confirmed by analyzing the rDNA sequence pattern, with the pathogen's ITS1-5.8S-ITS2 region varying from 481-541bp, indicating that *A. rabiei* isolates were highly conserved. In all of the *A. rabiei* isolates, the ITS 1 and ITS 4 primers amplified a 541bp band. Sequencing of the 35 representative fungal isolates confirmed the identification as *A. rabiei*, with 100% nucleotide sequence similarity to ITS region sequences available on the National Center for Biotechnology Information (NCBI). All of the isolates ITS sequences were registered at NCBI GenBank with the accession numbers: MZ323178, MZ323179, MZ323180, MZ323181, MZ323182, MZ323183, MZ329151, MZ323184, MZ323185, MZ323186, MZ314597, MZ314598, MZ314599, MZ314600, MZ314601, MZ314602, MZ314603, MZ314604, MZ314605, MZ314606, MZ323092, MZ323093, MZ323094, MZ323095, MZ323096, MZ323097, MZ323098, MZ323099, MZ323100, MZ323101, MZ323102, MZ323103, MZ323104, MZ323105, MZ323106 respectively. This is the first paper to describe the detection of genetic diversity in *A. rabie* population and the presence of both mating types in the Iraqi Kurdistan region.

[Rezan Muhammad Salih Ali (Iraq), College of Agricultural Engineering Science, the University of Sulaimani, Supervised By Prof. Dr. Emad Mahmood Al-Maaroof (Doctorate, 2022)].

Diagnosis, Resistance of Palm Borers and Isolation of Pathogenic and Associated Fungi in Salah al-Din Governorate.

A field survey of palm borer insects was conducted in some palm-growing areas, including Dhuluiya, Al-Mu'tasim, and Tikrit in Salah Al-Din Governorate for the period from 1/10/2020 to 10/30/2021. One species and two genera were recorded, including *Oryctes elegans* Prell, *Pentodon* sp, and *Tanyproctus* sp., which were identified phenotypically and molecularly, *O.elegans* and *Tanyproctus* sp outperformed with the highest number of adults in Tikrit region, the number of adults reached 501 and 362, respectively, while the highest number of *Pentodon* sp. was 295in Dhuluiya region.The results of population density and seasonal presence of males and females of *O. elegans*, *Pentodon* sp and *Tanyproctus* sp., showed the highest population density in June, reaching 224 and 192 for *O. elegans*, 145 and 132 for *Pentodon* sp, 68 and 57 for *Tanyproctus* sp, respectively. The number of palm borer adults caught by the IPM trap of the *O. elegans* and *Pentodon* sp superior to other traps resulting in 418 and 236.3 adults/trap, respectively, while the local trap outperformed in catching the largest number of palm borer of the *Tanyproctus* sp, which reached 312 adults/trap. 30 different fungal isolates were isolated from different samples, including soils of some palm orchard sites and some insects located in the areas of Dhuluiya, Al-Mu'tasim, and Tikrit.

A preliminary screening of the isolated fungi was carried out using the flour beetle *Tribolium castaneum* as a guide to estimate their pathogenicity; the results showed the superiority of both spores suspension and fungal filtrate of isolates (H2, H5, H7, H16, H22, H24, H25, H26, H27, H28, H30) in killing flour beetle larvae, as it achieved the highest mortality rate of 100% during the 48 hours. These isolates were morphologically identified to the genus level, and the diagnosis was confirmed to the species level by molecular analysis based on the nucleotide sequence of the 5.8S rRNA gene and its conformity with the strains of fungi in the World Genetic Bank. To evaluate the efficiency of some virulence factors of isolated fungi, all selected (high pathogenic) isolates showed their production of chitinase enzyme, the isolates *T. harzianum* (H16), *M. brunneum* (H2), *F.equiseti* (H26), *P.parvofructum* (H5) and *P.griseofulvum* (25) were superior on other isolates in recording the highest activity of this enzyme, which reached 3.59, 3.15, 3.12, 3.11 and 3.02 units/ml, respectively, The isolates *T. harzianum* (T16), *M. brunneum* (H2), *B.bassiana* (H5) and *F.equiseti* H26 were significantly outperformed in the protease activity, which reached 2.21, 2.17, 2.15, 2.08, 2.11 units/ml, respectively. The results showed that all fungal isolates were able to grow in the presence of the pesticide Dominant, and the highest compatibility was recorded by *M. brunneum* (H2), *T. harzianum* (H16) and *A. flavus* (H24), as the growth rate of these fungi was 100% in the presence of all Dominate concentrations. The results also showed the superiority of all treatments that included *M. brunneum* and *T. harzianum* with the pesticide Dominant in mortality rate of borer larvae and adults compared to the control treatment. The best treatments showed mortality rate 100% within 24 hours by the treatments (*M. brunneum*+Dominant0.5g/L) and (*T. harzianum* + Dominant 0.5g/L), followed by (*M. brunneum* +Dominant 0.25g/L) and (*T. harzianum* + Dominant 0.25g/L), which achieved a mortality rate of 100% on the second day of treatment, compared to the Dominant treatment at the concentrations (0.5 and 0.25g/L), which achieved mortality rate of 100% on the third day of the treatment. The results of evaluating the efficiency of two types of light traps in catching palm borer insects showed that the IPM trap gave the highest numbers of caught male insects of the *O.elegans* in June, May and April, as the number of males reached 197,175,131 adults/trap, respectively, compared to the number of females, which amounted to 171,154,128 adults /trap respectively. IPM trap also gave the highest numbers of caught male insects of the *Pentodon sp*.

in June, May and April, as the number of males reached 125,111,102 adults/ trap, respectively, compared to the number of females, which amounted to 113,97, 96 adults/trap, respectively, while the local trap showed the largest number of *Tanycautus spp* insects in the same months, the number of males reached 61,46,29 adults/trap compared to the number of females, which amounted to 49, 38,21 adults/trap, respectively. In a field study conducted in palm orchards in three locations, including Dhuluiya, Al-Mu'tasim and Tikrit, *M. brunneum*10^{10}) CFU/ml) treatment on shoots system + surrounding soil conducted highest mortality rate reached 72.67%, followed by the treatment of *M. brunneum* (at the same concentration) on the shoots system as it reached 63.67% in April, while in *T. harzianum* treatment, highest mortality rate reached 58.67% when shoots system + surrounding soil treated with this fungus at 10^{10} CFU/ml, compared to 55.67% in treated shoots system with the same concentration in April. The effect of *M. brunneum*, *T. harzianum* and Dominant on the different stages of *O.elegans* in the spring spray showed the superiority of (*M. brunneum*+ Dominant 0.5g/L) treatment on other treatments after 12 days, in which the highest mortality rate was 89.67%, followed by (*T. harzianum* +. Dominant 0.5g/L), with a mortality rate of 86.67%. In the autumn spray, the treatment of (*M. brunneum* +Dominant 0.5g/L) after 12 days showed the highest mortality rate of 90.33%, followed by 82.67% in the treatment (*T. harzianum* + Dominant 0.5g/L), While the effect of the pesticide Dominant at a concentration of 1g/L during the two sprays, it outperformed the rest of the concentrations in the highest mortality

rate after six days of treatment, which amounted to 100%. In the experiment of the solid inoculation effect of the two fungi with the pesticide Dominant on the mortality rate of *O.elegans*, the results showed the superiority of *M*. *brunneum* over *T. harzianum* in which the highest mortality rate was 70.67% at 75 g/ palm tree compared to 63.67% in *T. harzianum* at the same concentration, during April, while the effect of the pesticide Dominant at 1g/L was superior to the rest of the concentrations in the highest mortality rate after six days of treatment, which amounted to 100%.**[Haider Ali Reda Al-Ezzi (Iraq), Tikrit University, Agriculture College, Supervised By: Prof.Dr.Abdullah Abdulkareem Hassan and Asst.Prof.Dr. Safa Zakaria Bakr (Doctorate Degree of Philosophy in Agriculture Sciences (Plant Protection), 2022)].**

Morphological and Molecular Characteristics of Fungi Associated with the flowering inflorescence Disease of date palm and evaluation of some Biological and Chemical Methods for its Control.

Inflorescence rot disease is one of the main diseases that affect palm trees, as it causes complete or almost complete damage to the flowering inflorescences, which spreads in palm orchards in Iraq, so this study was conducted to conduct a field survey of the disease in different cities of Salah al-Din Governorate and some cities from Nineveh, Kirkuk, Anbar and Diyala governorates, and various pathogens were isolated and diagnosed, in addition to the fungus *Mauginiella scaettae*, which is the leading cause of inflorescence flower rot, which is *Fusarium oxysporium*, *Fusarium solani* and *Alternaria radicina*. Enzyme-linked immunosorbent assay (ELISA). The infection rate and the sensitivity of some date palm cultivars to infection with these causes were also known. The biological control agent represented by *Pseudomonas fluorescens* and some chemical pesticides that were introduced within the integrated control program for inflorescence rot disease on palms was also tested**. [Khalaf Attyih and Maadh Alfahd (Iraq), Tikrit University - College of Agriculture, Department of Plant Protection, Iraq (Doctorate, 2022)].**

Contribution to the Research of the Potato Golden Nematode *Globodera rostochiensis* (Wollenweber) Antagonists and Evaluation of the Nematicidal Activity of Some Isolates of Antagonistic fungi

Cyst nematodes of the genus *Globodera* are among the most dangerous bioagressors of potato cropsin Algeria and worldwide. The control of these quarantine organisms is mandatory. Indeed, in order to develop biological control methods alternative to chemical products, fungi and bacteria associated with this bioagressor in Algeria were isolated and characterized. A total of 123 isolates were obtained, of which 117 are fungal and 6 bacterial. We have retained 79 fungal isolates belonging to 9 different genera which were characterized by PCR amplification of the ITS regions sequences and those of the Rpb2 gene. *Trichoderma* and *Fusarium* are the most dominant with 28 and 35 isolates respectively, followed by the other genera, which are poorly represented; these genera are: *Gliocladium; Alternaria; Cladosporium* with 7; 3 and 2 isolates, respectively*; Penicillium; Phoma; Stemphylium* and *Arthrobotrys* represented with 1 isolate each. The most frequent species are *T. harzianum, F. oxysporum* and *T. afroharzianum* with 19; 14 and 6 isolates, respectively. It is important to note that the association of the nine fungal genera reported in this study with *G. rostochiensis* cysts, as well as the species *T. hirsutum* and *T. afroharzianum* were recorded for the first time in Algeria. Finally, 4 bacterial isolates were identified by 16S rRNA ribosomal gene sequencing as *Bacillus* spp*., Rhizobium* spp.*,Stenotrophomonas* spp. And *Brucella* spp.The association of these genera with *G. rostochiensis* cysts was observed for the first time. Results on the evaluation of the nematicidal activity of some antagonistic fungal isolates against *G.rostochiensis* showed that all fungal isolates tested cause mortality of second stage larvae (J2) and inhibit egg hatching of these species. This nematicidal activity increases with the elevation of concentration and exposure time, exceeding 80% in the most effective strains, including *T. harzianum* (Th.8) and *F. oxysporum* (F.ox). The analysis of the data on the effect of these two tested species and their combination towards *G. rostochiensis in vivo* revealed that these treatments reduce the development of this nematode and improve the growth of potato plants, especially in a preventive application, recording a decrease of cysts in the soil by 55; 65 and 70%, an inhibition of egg hatching by 38; 44 and 57% and an improvement of the growth of potato plants by 8; 12 and 15% for *F. oxysporum* (F.ox), *T. harzianum* (Th.8) and *T. harzianum* (Th.8) + *F. oxysporum* (F.ox) respectively. This study is completed by the biochemical purification and characterization of the active molecules responsible for the efficiency against *G. rostochiensis*. The chemical screening revealed that the antagonistic fungi analyzed by LCMS, namely *T. harzianum* (Th.8), *T. hirsutum* (T29) and *F. oxysporum* (F.ox) are rich in secondary metabolites such as peptaibols, polyketides, terpenes and trichotecenes. The main metabolites characterized from the organic extracts of the three fungal isolates tested are harzianic acid, harzianolide and fusaric acid, respectively, which showed a significant antagonistic power towards *G. rostochiensis* larvae and eggs *in vitro*, which increases with increasing

SMs concentrations (25, 50 and 100 µg/ml) and exposure time (24, 48 and 72h). The percentages of larval mortality and egg hatching inhibition recorded by these metabolites exceeded 80% for high concentrations, particularly for the most effective isolates, including *T. hirsutum* (T29) and *T. harzianum* (Th.8). The LD50 values calculated for the evaluation of the efficacy of the secondary metabolites of the fungal extracts tested on the mortality of *G. rostochiensis* larvae are inversely proportional to the exposure time. Finally, the use of these antagonistic microorganisms and their secondary metabolites offers an opportunity for the development of bio-nematicide formulations. It appears to be a promising alternative approach for the sustainable management of the golden potato nematode. **[Nawal Bentoumi (Algeria), (Department of Botany, the National Higher School of Agronomy, Algiers, Algeria) Supervised by Prof. Samira Sellami defended on March 29th 2022, (Doctorate, 2022)].**

Identification and Study of the Antagonistic Effect of *Trichoderma* spp. of Different Soils and Ecosystems in Algeria to Manage Some Fungal Diseases

Fungi are the cause of many plant diseases, which cause significant yield losses, sometimes leading to the destruction of crops or even entire fields. To control these diseases by biological methods, the use of strains of *Trichoderma* spp. has been extensively investigated and proven to be efficient against several species of pathogenic fungi and to be reliable in fungal disease management. Among the goals of this study is to constitute a collection of *Trichoderma* spp, isolated from soil in different areas (North, East, West and South) and ecosystems in Algeria. *Trichoderma* isolates were identified at the species level by sequencing the internal spacers (ITS1 and ITS2) of rDNA and a fragment of the translation elongation factor gene 1- α (Tef1). A total of 46 *Trichoderma* spp. were identified, and attributed to *T. atroviride* (12 strains), *T. gamsii* (10), *T. orientale* (1) and 23 to the species complex of *T. harzianum* (T*. harzianum, T. afroharzianum, T. atrobrunneum* and *T. guizhouense*). In the present study, we highlight that T. *gamsii, T. oriental, T. atrobrunneum and T. guizhouense* are reported for the first time in Algeria. The growth rate of the isolates was evaluated at temperatures ranging from 10 to 40 ° C on PDA and SNA culture media. In general, the highest growth rate was recorded at 25-30 ° C. However, *T. oriental* was able to grow at 40 ° C, while other species did not grow at this temperature. Antagonistic activity of *Trichoderma* spp. were carried out by *in vitro* and *in vivo* based bioassay. By *in vitro* test the antagonist effect of all the isolates was carried out against four pathogenic species associated with strategic crops in Algeria: *Fusarium culmorum, Botrytis cinerea, Alternaria solani* and *Rhizoctonia solani* on PDA medium by direct and indirect confrontation. In the direct confrontation, the growth rate inhibition was between ranked between 37.22% and 80.95%, while in the indirect confrontation it was between 00% and 88.89%. In *planta* biocontrol test showed that *T. atroviride* (Ta.09), *T. orientale* (To.15), *T. afroharzianum* (T af. 17 and T af. 37) and *T. gamsii* (T g. 39) have shown good results against *F. culmorum*, the primary crown rot pathogen of wheat in Algeria. This finding is based on the significant decrease in disease severity compared to the control (> 82%). The recorded data also showed that *T. atroviride* (Ta.09) recorded the highest percentage of disease reduction (97.28%). Results obtained in the present study showed that native *Trichoderma* isolates are very promising for crown rot control and can be used as part of an integrated disease management. **[Saliha Chihat (Algeria), (Department of Botany, the National Higher School of Agronomy, Algiers, Algeria) under the supervision of Dr. Houda Boureghda. (Defended on July 14th 2022 (Doctorate, 2022)].**

Isolation and Diagnosis of the Pathological cause of Dieback Disease of Orange *Citrus sinensis* Tree In Baghdad

The study was conducted in the college of Agricultural Engineering sciences / Baghdad University for the season 2021-2022. The study aimed to isolate and molecular diagnosis the pathogenic fungi causing dieback disease in orange trees in Baghdad Governorate (Al-Jadiriyah and Al-Dora orchards), Iraq. The isolation results on the Potato dextrose agar (PDA) media and the phenotype characterization show the presence of two *Didymella* species, *D.microchlamydospor* and *D.pomorum* in all infective orange branches samples from Aljadiriah and Al-Dora, with a frequency of 41.65 and 61.9 % respectively. The molecular diagnostic results, using Polymerase chain reaction (PCR), and the nucleotide sequence analysis based on the ITS1 and ITS4 regions, confirm that the fungal isolates were *Didymella microchlamydospor* and *D. pomorum* with100% and 99% matching with the global isolates deposited in the NCBI gene bank respectively. The fungal isolates have the Accession number OM562208 for *D. Microchlamydospora* and OM562209 for *D. pomorum* .The pathogenicity tests by inoculating the orange seedlings branches of two years old with *D. microchlamydospor* and *D. pomorum*, or its filtrate showed leaf wilting and wrapping after 24 hours of treatment. The cross sections of the infected orange branches showed brown colouration in the vascular bundle's area, with deformation of the epidermis and the cortex layers. This is the first record of these two pathogens as the causal agents of dieback diseases on orange trees in Baghdad, Iraq. **[Doaa Ali Fares and Neran Salem Aljarah (Iraq), College of Agricultural Engineering Sciences, Baghdad University, Iraq, NeuroQuantology Vol.20, Page 1002-1015,2022. (Master, 2022)].**

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FAO Plant Protection Activities

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

» FAO Organizes a Program for Training and Exchanges of Expertise in the Field of Biological Control of Fall Armyworm

Egypt, 9-12 May 2022

Within ongoing cooperation between the Food and Agriculture Organization (FAO) and the Ministry of Agriculture and Land Reclamation in the Arab Republic of Egypt, FAO organized an advanced training program on producing biopesticides and the mass production of the natural enemies to combat Fall Armyworm. In the framework of the Regional FAO project *"**Emergency preparedness and response to strengthen capacities of the NENA countries to mitigate the risk of Fall Armyworm (FAW) in the region,**"* a delegation of experts from the plant protection division and biological control Department at the Ministry of Agriculture , Syria was received by the Plant Protection Research Institute (PPRI)-ARC-Egypt.

Mr. Thaer Yaseen, the Regional Plant Protection Officer, FAO-RNE, stated that the training program comes within the FAO regional plan to support and strengthen the capacities of the FAW-affected countries in the NENA region to control FAW using sustainable and safe methods such as the biological control to reduce the use of the chemical pesticides and to protect the environment and human and animal health. In his opening speech, **Mr. Ahmed Abdel Mageed**, the head of the PPRI presented the main activities of the institute also, the collaboration between PPRI and the FAO to combat FAW through the monitoring, survey programs, the various strategies and actions that have been taken to combat the pest in Egypt. The Regional Plant Protection consultant, FAO-RNE, welcomed the experts and stated the various FAO efforts to contain the FAW in the region. She stressed the need for sustainable control methods, the importance of regional cooperation, and the exchanges of expertise in the field of biological control of FAW. The Advisor to the Minister of Agriculture for Agricultural Quarantine and Phytosanitary added that through the initiative of the FAO Global Action, IPM packages are currently being tested in Egypt as a demonstration country. This package includes using the natural enemies as the biological control to combat the Fall Armyworm. The training program started with a visit to the biopesticide production unit in Giza, where **Mr. Ahmed Adly** and his teamwork presented the unit's activities and explained the methods of producing fungal, bacterial, viral, and nematode biopesticides and their effectiveness in mitigating the impact of Fall Armyworm. The delegation also was received by **Mr. Hossam El-Gabaly**, the director of the Biological Control Lab and his team work in Shandawil -Sohag who introduced the activities of the lab, the mass rearing of the host pests, the synthetic media, and the mass production of the FAW natural enemies, including various parasitoids, predators, and spiders. The experts from Syria participated in the mass release of different parasitoids such as Telenomus and Trichogramma in some maize fields. Finally, the visit programme was achieved as planned by FAORNE, and was distinguished by the valuable scientific discussions and the exchange of experiences between the Syrian and Egyptian sides in biological control. In Syria, it is worth mentioning that there are five laboratories for breeding natural enemies, three of which are operational and two affected by the conditions of instability in its regions. It is noteworthy that once the presence of Fall Armyworm (FAW) was confirmed in Egypt, the FAO began setting up technical cooperation programs to provide support and train many specialists, also providing the ministry with the traps and special tools to monitor and control the FAW pest. FAO assisted officials in developing a plan and providing technical and scientific consultations and upgrading the Egyptian laboratories for the mass rearingmies.

» FAO launches the Global Action on One Country One Priority Product in the Near East and North Africa

20 June 2022, Cairo

The Food and Agriculture Organization of the United Nations (FAO) in the Near East and North Africa has launched the implementation of the Global Action on Green Development of Special Agricultural Products: One Country, One Priority Product (OCOP) in the region. "The key to solving many of the challenges in this region is to move towards the sustainable development of our agrifood sector, to produce more quality food more efficiently, to improve livelihoods for food producing communities, and at the same time to restore our fragile ecosystems and preserve water and biodiversity," Abdulhakim Elwaer, FAO Assistant Director-General and Regional Representative for the Near East and North Africa said during the launch event. The OCOP initiative, which was announced globally by FAO Director-General in 2021, will support countries in their efforts to transform national agrifood systems towards more resilience, sustainability, inclusiveness, and efficiency. The country-led approach of the initiative relies on developing the value chains for special agricultural products (SAPs) with unique quality and untapped potential for production and market growth. The interventions will aim to support small and family farmers' access to high-value markets, generate income for communities with a focus on women and youth, optimize the use of natural resources and energy, and improve the nutrition and food security of the population. A central element of the Global Action is to promote and scale up innovation, partnership, and exchange knowledge on greening production, storage, processing, and market within and among countries. The initiative aims to optimize the production and market systems of SAPs, minimize post-harvest losses and food waste, maximize climate adaptation and use of climate-smart technologies and increase their direct or indirect contribution to improving nutrition and food security. In the run-up to the launch, Egypt, Jordan, Lebanon, Morocco, Syria, Tunisia, and Yemen have expressed interest in joining the Global Action and submitted their priority products to be considered in the implementation phase. "The main objective for organizing the OCOP regional launch event is to get every Member on board and actively engaged in the OCOP, leaving no one behind," stated Beth Bechdol, FAO Deputy Director-General, as she gave her remarks virtually from FAO's headquarters in Rome. Ministers of Agriculture from the aforementioned countries expressed their commitment to the OCOP initiative and highlighted how it aligns with their national agendas and objective of transforming agrifood systems in their countries. An interactive panel discussion involving representatives of international financial institutions, regional bodies, and research institutions identified some key entry points to use the enabling power of investment, policy, and partnership to ensure that the interventions in countries happen at the necessary scale and speed towards achieving the SDGs. FAO is planning a regional Technical Cooperation Programme (TCP) to enable the seven countries to conduct an in-depth value chain analysis, which will act as a foundation for developing detailed investment strategies and action plans. The process will support establishing partnerships through dialogues and engagement with resource partners and the private sector to upgrade the value chains to reach their full potential. https://www.fao.org/neareast/news/view/en/c/1542558/

» FAO Drives Action on Water Scarcity in the Near East and North Africa Region

Launching today the Inter-Regional Technical Platform on Water Scarcity

28/06/2022

28 June 2022, Cairo, Egypt – "The inter-Regional Technical Platform on Water Scarcity can help transform more efficient, inclusive, resilient, and sustainable agri-food systems for better production, better nutrition, a better environment, and a better life for all, leaving no one behind," said **Qu Dongyu**, Director-General of the Food and Agriculture Organization of the United Nations (FAO). This came during today's launch of FAO's inter-Regional Technical Platform on Water Scarcity (iRTP-WS), which will support countries and regions in scal-

ing-up relevant water-related actions, programs, and policies to cope with water scarcity and food insecurities amid the unprecedented challenges of climate change, and socio-economic vulnerabilities due to disasters and instability. "Water needs to be more strategically positioned on the global climate change agenda in the Near East and North Africa region," Qu added. While not intended to directly implement projects or programs, the platform is envisioned to be an inter-regional collaborative mechanism on water-related topics that facilitates the policy-science dialogue and outreach, accelerates the mutual exchange and uptake of proven effective and sustainable solutions already available, and promotes innovative ones, towards the enhancement of food and water security. "As a platform for collaboration and partnerships, the inter-Regional Technical Platform has the potential to facilitate information exchange, create synergies, promote joint activities and future collective planning, not only in this region or within FAO, but across the regions and beyond FAO. There is a wealth of local knowledge and experiences that we all can learn from each other," stated HRH Princess **Basma bint Ali**, FAO Goodwill Ambassador for NENA, while addressing the opening of launch of the platform. The iRTP-WS is expected to strengthen the engagement of existing Communities of Practices in water-related fields toward a more sustainable and more resilient future. It will also facilitate the formation of multi-disciplinary teams to address complex topics and accelerate the achievements of the SDGs, with a special focus on SDG 6 (Water and Sanitation) and SDG 2 (Zero Hunger) and their associated targets and considering the interlinkages across other related SDGs. "As a hub for partnerships, exchange and learning, the Platform will contribute to the development and dissemination of proper approaches and tools addressing water scarcity and water-related objectives across different stakeholders and partners," said **Abdel Hakim Elwaer**, Assistant Director-General and FAO Regional Representative in the Near East and North Africa (NENA), in his welcoming remarks. "The platform will also support scaling-up investments by enabling interaction with donors and financiers and by promoting public-private dialogue," Elwaer continued. The iRTP-WS will offer information and material on four main themes: Resilience and Climate Change Adaptation; Water Productivity Tools and Analytics; Non-Conventional Water Resources; and Water Governance.
https://www.fao.org/neareast/news/view/en/c/1565155/

» FAO Award for Innovation

Innovation is changing how food is produced, processed, traded, and consumed and building more efficient, inclusive, resilient and sustainable agrifood systems.
The FAO Award for Innovation recognizes ground-breaking innovations in areas under FAO's mandate to Members or non-state partners, including institutions, individuals, international/regional organizations, academic or research entities, civil society groups, private sector entities and FAO employees.

Basic Criteria
The winning institution/organization demonstrates that they successfully contributed to an area of work related to FAO's mandate, meeting one or all of the following criteria:
Award-specific criteria:

- Have an impact on more than one level of the supply chain, from farmers to consumers.
- Strengthen the link between farmers and consumers, e.g., through tracking sustainability features of traded food and agriculture products on labels, innovative institutional mechanisms, etc.

General criteria:

- Quality and merit of the innovation
- Potential benefit, impact and sustainability
- Scalability
- Value for money
- Role of youth (under 35), and/or women, and/or marginalized groups

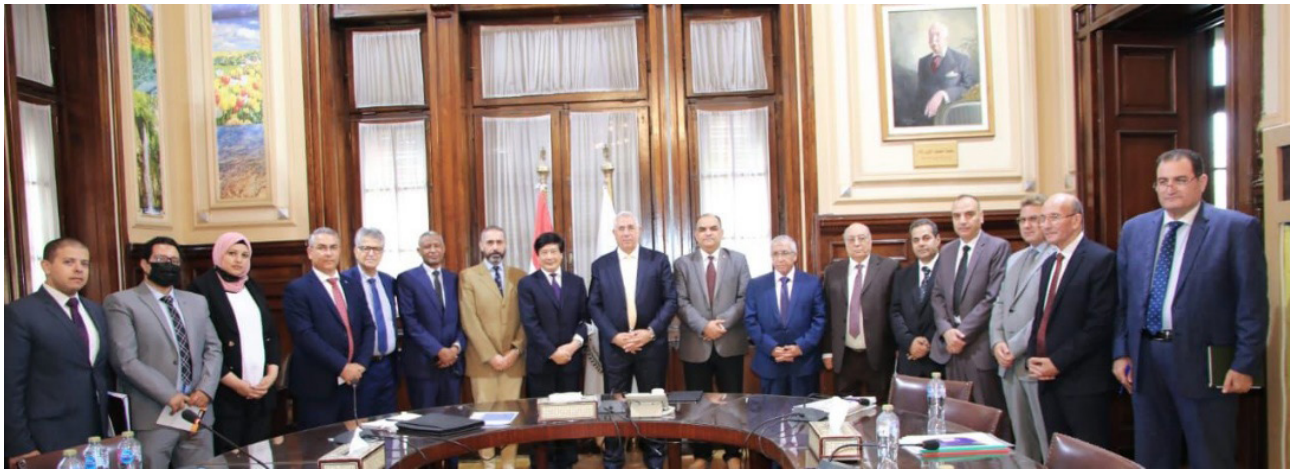
Selection Process
Proposals for nominations presented by national, regional, or global institutions should be submitted to FAO Representatives (in countries with an accredited FAO Representative) or to FAO Regional and Subregional Representatives (in countries with no accredited FAO Representative), as appropriate, for submission to the Awards Secretariat by 24 July 2022. The Award is conferred for activities and programmes with remarkable achievements during the biennium preceding the current one. The Director-General will present the Award to the individual or representative of the recipient institution during a special ceremony at the 171st session of the FAO Council 5-9 December 2022.

TIMELINE- End May - Call for nominations, **July** - Close call, **August-September** – Screening-**October- November**- Selection, **December** - Ceremony. https://www.fao.org/fao-awards/innovation/about/en

» FAO and Egypt Strengthen Ties to Ensure Food Security, mitigate the Risk of Climate Change, and Combat Transboundary Plant Pests such as Fall Armyworm

19 June 2022, Cairo, Egypt

A delegation from FAO led by the director of plant production and protection (NSP), the regional plant protection officer, FAO Representative in Egypt, and FAO Deputy Regional Representative for the Near East and North Africa met with His Excellency the Minister of Agriculture and Land Reclamation of Egypt, **Mr. El Sayed El Quseir**. The Minister expressed his appreciation for FAO's efforts in ensuring food security for a growing global population and mitigating the risk of transboundary plant pests such as the fall armyworm (FAW). Mr. El Qasir emphasized that the food deficit is not just an agricultural problem but relates to national and regional security. Egypt is working on parallel tracks to support food security through horizontal expansion by the reclamation of new areas and vertical expansion by increasing productivity and production. His Excellency praised the joint efforts between the Ministry of Agriculture and the FAO, especially in implementing the IPM-national plan against the FAW through the global action initiative, as well as FAO's efforts in many other projects in Egypt, in particular, and the region in general. **Mr. Jingyuan Xia**, the plant production and protection director, stated that Egypt is one of the region's most prosperous countries in combating the Fall Armyworm. Thus, Egypt has been selected as a demonstration country to pilot different technologies and evaluate the IPM package for controlling the FAW with significant support from FAO. In light of the present global challenges, the results of these technologies will serve as a road map for other countries in the region to contain FAW and eventually enhance food security. FAO Representative in Egypt, **Mr. Nasredin Hag Elamin**, highlighted the long history of collaboration between FAO and the Ministry of Agriculture in implementing several technical projects to attain agricultural sustainability, food security, and rural development. **Mr. Thaer Yaseen**, Regional Plant Protection Officer, FAO-RNE, emphasized the fruitful collaboration between the FAORNE office and the ministry's authorities, including the research institutes, Agricultural Directorates, and the Central Administrations of quarantine, extensions, and control. Mr. Thaer Yaseen continued, "Through the previous technical projects and now with the global action project, the FAO has supported Egypt to strengthen its capacities to mitigate the risk and management of fall armyworm." Many actions have been done to help farmers and technical cadres improve their capacities in monitoring, identifying the pest, and biological control. He added that the FAO had adopted the Farmer Field School (FFS) approach to raising farmer awareness and implementing sustainable pest management solutions. It was agreed during the meeting to host a regional conference in one of the governorates where the fall armyworm control actions took place. Representatives from the FAO, the ministry, and other stakeholders will be invited to know about Egypt's experiences and successes in this area. The meeting was also attended by **Dr. Mohamed Abed El- Mageed**, the Chairman of the Agricultural Pesticide Committee and fall armyworm committee; **Dr. Mohamed Soliman**, the President of the Agricultural Research Centre (ARC), **Dr. Ibraheem Al Juboori**, President of the Arab Society for Plant Protection; **Dr. Ali Soliman**, advisor to the Minister of Agriculture for Agricultural Quarantine and Phytosanitary; **Dr. Saad Moussa**, supervisor of Foreign Agricultural Relations, **Dr. Ahmed Al-Attar**, head of the Central Administration of Agricultural Quarantine and some representatives of the FAO and the ministry.



» The RNE ADG reviews the regional challenges, opportunities, and priorities with the NSP director

19 June 2022, Cairo, Egypt

The FAO Assistant-Director General and Regional Representative for the Near East and North Africa region Mr. Abdulhakim Elwaer received at the organization's regional office in Cairo Mr. Jingyuan Xia, the director of Plant Production and Protection (NSP)-FAO. The meeting was attended by Mr. Nasredin Hag Elamin, the FAO Representative in Egypt; Mr. Jean-Marc Faurès, the Regional Program Leader; Mr. Thaer Yaseen, the regional plant protection officer; and Mr. Ibraheem Al Juboori, the president of the Arab Society for Plant Protection. The meeting was an opportunity to brief about the key strategic priorities, regional challenges, and projects and activities related to plant production and protection in the region.

» Global Action for the Fall Armyworm Control in Egypt as a Demonstration Country for the NENA Region

19 June 2022, Cairo, Egypt

On a visit to Egypt, the director of plant production and protection (NSP), Mr. **Jingyuan Xia**, and Mr. **Thaer Yaseen**, the regional plant protection officer, held a meeting with a ministerial delegation led by. **Dr. Mohamed Abed El- Mageed**, head of the agricultural pesticides committee and focal point of the Global Action initiative in Egypt, and members of the fall armyworm committee. **Abed El- Mageed** presented the main practices of the IPM national plan of fall armyworm and what has been implemented in the project activities. It was agreed to host a regional conference in one of the governorates in Egypt where the fall armyworm control actions took place. Representatives from the FAO, the ministry, and other stakeholders will be invited to investigate Egypt's experiences and successes in this area.

» FAO Delegation- Visit the Biopesticide Production Unit in Cairo Egypt

19 June 2022, Cairo, Egypt

The director of Plant Production and Protection (NSP), the Regional Plant Protection Officer, and the NENA Regional Plant Protection Consultant visited the biopesticide production unit in Giza. The unit's activities include the production of fungal, bacterial, viral, and nematode biopesticides were demonstrated. The delegation discussed the upcoming FAO support through the global action project and how to scale up the unit's capabilities for massive biopesticide production to control the fall armyworm in Egypt.

» FAO Delegation Visits the Natural Enemies Laboratory in South Egypt, Shandawil -Suhag

20 June 2022, Cairo, Egypt

The director of Plant Production and Protection (NSP), the Regional Plant Protection Officer, and the NENA Regional Plant Protection Consultant visited the Biological Control Lab in Shandaweel -Suhag. This lab was upgraded and enhanced with FAO support through a previous TCP/EGY/3706 project. During the visit, the FAO delegation viewed the several processes of the mass natural enemy's production, including some parasitoids, predators, and spiders, and the different methods for rearing the insect hosts. A field visit was organized to the corn fields where the parasitoids have been released. The delegation carefully discussed with the farmers the effect of such a combination between parasitoids and Bt. The delegation witnessed the promising results of the experiment and suggested some actions to be implemented in the upcoming activities.

» The Progress in Global Action (GA) Implementation in the Demonstration Country -Egypt

20 June 2022, Cairo, Egypt

On a side visit to Upper Egypt, the director of Plant Protection and Production (NSP), the Regional Plant Protection Officer, and the NENA Regional Plant Protection Consultant visited some maize fields at the research station of Shandawil -Suhag. The station was chosen by the ministry of agriculture to implement some of the IPM package activities. Some of the technology assessments that were implemented in the previous maize -season included the impact of different maize varieties, plant densities, planting dates, intercropping with other legume crops, biological control, and chemical control. The ministry of agriculture will resume the technological assessment in the current growing season of maize. The FAO delegation witnessed some maize fields that will be cultivated this season to assess the effect of some agricultural practices on FAW infestation.

» Farmer Field School (FFS) of Fall Armyworm in Dandara, Qena- Egypt is a Major Success

21 June 2022, Cairo, Egypt

On the side of a visit to Upper Egypt, the director of Plant Production and Protection (NSP), the Regional Plant Protection Officer, and the NENA Regional Plant Protection Consultant followed up on the role of FFS implementation in controlling the FAW in Egypt. In a side meeting and face-to-face discussions with the local maize farmers, the farmers highlighted how the FFS approach enhanced their skills for transferring knowledge and experiences, decision-making, and finding the appropriate solutions for FAW management. The farmers emphasized the necessity of adopting this experience with other pests and crops in their fields. Comprehensive discussions were made with Mr **Mohamed Mousa** the FFS facilitator, and the farmers to explore the lessons learned from the FFS and how to develop such initiatives for other crops.

» FAO Explores Egypt's Potential for the Mass Production of Natural Enemies for FAW Management

22 June 2022, Cairo, Egypt

The director of plant production and protection (NSP), the Regional Plant Protection Officer, and the NENA Regional Plant Protection Consultant visited the Bio-Agriculture Services center in Aswan. The center was established in 2004 as an initiative supported by WFP and the Ministry of Agriculture to offer environmentally friendly biofertilizers and biopesticides to the new reclamation areas, particularly near Nasser Lake - South Aswan. The FAO delegation discussed with the center management how to enhance the center's capabilities to reproduce the natural enemies as previously targeted the fall armyworm and other pests to be applied in Egypt and the surrounding countries.

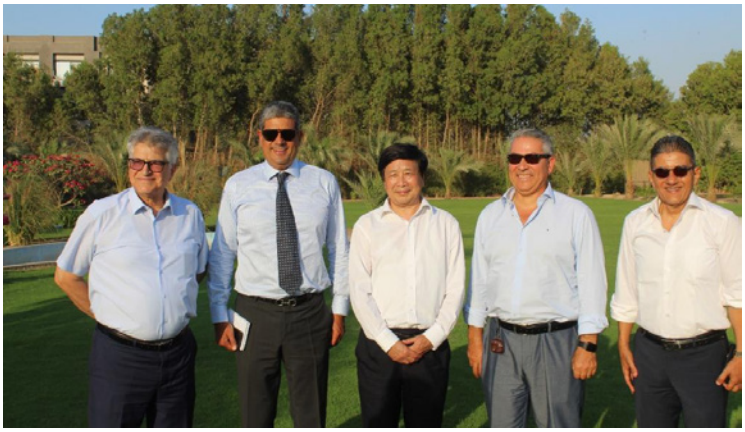
» The FFS: An Approach to Strengthen Small-Scale Farmers' Role in Red Palm Weevil Control in Egypt

22 June 2022, Cairo, Egypt

The red palm weevil (RPW) is a key transboundary pest of date palm that causes negative impacts on date production, farmer livelihoods, and consequences on food security and rural community. FAO has provided substantial technical assistance to strengthen the farmers' capacities to manage RPW. On a side visit to Egypt, a delegation from the FAO led by the director of plant production and protection (NSP), the Regional Plant Protection Officer, and the NENA Regional Plant Protection Consultant visited the farmer field school for date palm in Benban, Aswan, Upper Egypt. The farmer field school (FFS) was established recently and is formed by 18 local small-scale farmers, said Dr **Mohamed Kamal**- The National Coordinator of the red palm weevil project in Egypt. During the visit, farmers highlighted to the delegation the main pests and diseases challenging the date palm productivity in their fields. They requested more support and efforts from the FAO to reduce the spread of the pest and the yield losses. During the discussion, the director of plant production and protection, Mr **Xia Jingyuan** emphasized the value of the FFS in boosting farmers' participation in the IPM program. He stated that the FFS is a form of education that builds farmers' knowledge through methods of experiential learning. During the FFS session, **Mr Ibraheem Al Juboori**, the FAO Regional Plant Protection Consultant, delivered a lecture on the main pests affecting the date palm. While **Mr Thaer Yaseen**, the regional plant protection officer, demonstrated to the farmers the main principles of IPM of RPW and how to carry out the Agro-Ecosystem Analysis. During the visit, the FAO delegation carried visual inspection of some infected red palm trees. They demonstrated to the farmers how to diagnose the RPW infection and how to perform some good practices to stop the spread of the infestation.

» BugVap (Dog sniffer) Training Center Visit in Cairo

23 June 2022, Cairo, Egypt



Dog Sniffer is one of the essential tools for early detection of Red Palm Weevil; it is well tested in some countries but still not fully accredited by any of the authorities, although the detection accuracy reaches more than 80%; The director of NSP and the delegation members visited the site of dog training and investigated in details the process of detection with the company representative in Egypt; The delegation concluded that this technique should be included within the series of tests the FAO is running in cooperation with King Faisal University; A suggestion was raised from the regional consultant that the company's representative will deliver a lecture next year during the Global Conference of Plant Protection organized by FAO.

» Inception Workshop on "Emergency Preparedness and Response to Strengthen Management Capacities of Maghreb Countries to Mitigate the Impact and Risk of Fall Armyworm in North Africa" - "TCP/SNE/3901" in Mauritania

The Sub-regional FAO office for North Africa (FAO-SNE) organized an **Inception workshop** on "Emergency preparedness and response to strengthen management capacities of Maghreb countries to mitigate the impact and risk of Fall Armyworm in North Africa" under the **TCP project "TCP/SNE/3901"**. The event occurred in **Nouakchott,** Mauritania, from 31 May to 2 June 2022. Participants involved National Coordinators and National Consultants in the Maghreb Countries; experts from the Agricultural Research Center in Mauritania; experts from the Mauritanian Plant Protection Department; experts from the NENA countries; and experts from FAO. The objective of this workshop is to launch the FAO regional project in the Maghreb countries to scale up the regional response to the Fall army worm (FAW), *Spodoptera frugiperda*, and to strengthen the management and preparedness capacities of five North African countries (Algeria, Libya, Mauritania, Morocco, and Tunisia) to mitigate the impact and risk of FAW, as the invasive pest continues to spread rapidly to new countries causing serious damages to food production especially corn and rice and affecting food security and rural livelihoods. The workshop aimed to raise awareness of FAW and to build capacity on FAW biology, monitoring and best practices of control, use of the application FAMEWS and FAW management through training of trainers and Farm Field Schools. During three days, the project and its activities were presented, the status of the Fall Armyworm in the five Maghreb countries was evaluated. The floor was opened to the participants to exchange knowledge and expertise in the field of FAW management between the countries of the Maghreb and the NENA countries; coordinate efforts, and work in a group to develop a national action plan to implement the project in each country.

» IPPC, FAO Hold an Annual Regional Workshop with Near East and North Africa Member Countries

Posted on Wed, 03 Aug 2022, 07:48

Tunis, August 1-4, 2022: The annual regional workshop among member countries of the Near East and North Africa (NENA) region is being held this week in Tunis, Tunisia, to improve and modernize plant protection programs while encouraging regional and international cooperation. The hybrid workshop was organized by the Food and Agriculture Organization (FAO) Regional Office and sub-regional office for the Near East and North Africa, in collaboration with the Secretariat of the International Plant Protection Convention (IPPC) and the Near East Plant Protection Organization (NEPPO), and the Ministry of Agriculture, Water Resources and Fisheries Several experts, including official representatives from Algeria, Saudi Arabia, Libya, Lebanon, Morocco, Mauritania, Syria, Egypt, Iraq, Jordan, Iran, Yemen, Qatar, Sudan, Kuwait, and Tunisia, resumed face-to-face meetings this year after two years of virtual exchanges due to constraints imposed by the COVID-19 pandemic. For four days, this exceptional forum paved the way for participants to exchange updated information on the prospects for coordination and collaboration among countries of the NENA region. The IPPC reported on the results of technical consultations on International Standards for Phytosanitary Measures (ISPMs), as well as updates on the activities of the IPPC Standards Committee and the Implementation and Capacity Development Committee (IC). Workshop participants are reviewing the comments from NENA member countries on the draft standards and other documents of the Convention. The workshop also focuses on current projects and a study on international measures and standards relating to the protection of plants and biodiversity in countries and how to facilitate safe trade. In his opening address, **Elyes Hamza**, Minister of Agriculture, Water Resources and Fisheries, recalled the harmful consequences of diseases and the circulation of pests, parasites, viruses, insects, and fungi on plants in the NENA region. FAO estimates that up to 40 per cent of global crop production is lost annually to pests. A perfect illustration is Tunisia's unprecedented pest contamination which decimated 8 000 hectares of cultivable areas down to 3 100 hectares, or a 61 per cent loss. This was brought on by the fire blight disease during the adoption of arboriculture, or the cultivation of trees and shrubs. **Abdelhakim El Waer**, FAO Assistant General Director and Regional Coordinator of the FAO for the Near East and North Africa, recalled that "the application and respect of international phytosanitary standards help countries in the region improve access of their agricultural exports to world markets and entry to the most competitive markets in Europe, Asia and America. "In addition to threats to human health, the continued prevalence of plant pests and diseases poses a serious threat to food security. The damage to agriculture exacerbates the growing problem of world hunger and threatens the means of rural subsistence,"he says. IPPC Secretary **Osama El-Lissy** emphasized the essential role that innovative plant health methods have in guaranteeing the right to food for everyone. He reminded participants that preventative international phytosanitary standards are key to avoiding costly eradication and control responses to emergency pest outbreaks in all regions of the globe."The IPPC has an important role in protecting plants and in combatting hunger on a global scale. The IPPC Secretariat remains committed to working together with FAO and national and regional plant protection organizations in fulfilling our collective mission. That is, to safeguard agricultural and natural resources against invasive pests and diseases. We also work to facilitate the safe trade not only of plants, plant products, and regulated articles but also of agricultural crops that will help feed an increasingly hungry global population," **El-Lissy** says. Plant health experts at the workshop also address the region's most urgent plant pest concerns that threaten agricultural development and food security. Among these include red weevil, which threatens palm trees; fall armyworm, which attacks cereals like maize; the fourth tropical strain of Fusarium, which causes banana wilt disease; and the bacterium *Xylella fastidiosa,* which destroys olive trees.
https://www.ippc.int/en/news/press-release-ippc-fao-hold-an-annual-regional-workshop-with-near-east-and-north-africa-member-countries/

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

» FAO's Interregional Training on Biopesticide Use for Locust Control

An Interregional Training on Biopesticide Use for Locust Control was held in Agadir, Morocco, from 16 to 20 May 2022. The training was organized jointly by the FAO's Locust and transboundary plant pests and diseases team (NSPMD), the Commissions for controlling the Desert Locust in Western (CLCPRO) and Central (CRC) Regions, the Near East Plant Protection Organization (NEPPO) and the Moroccan National Anti-Locust Center (CNLAA), with the participation of the biopesticide producing company (Eléphant Vert). The training supports the FAO and the Desert Locust Commissions' efforts to promote biopesticide use in locust control as a safer alternative and a key pillar of the FAO's locust preventive control strategy. The training aimed to share experience, lessons learned on the use of biopesticides, and the registration status, as well as to train the participants on the handling and field application of the biopesticide. Eighteen participants from fifteen countries hosting locust-breeding areas in the Central and Western Desert Locust Regions, Somalia, and Kenya, in addition to FAO's experts, took part in this hands-on training.

» Thirty-Second Session of the Commission for Controlling the Desert Locust in the Central Region and its 36th Executive Committee Meeting

Jeddah, 05-09 June 2022

The 32nd Session of the Commission for Controlling the Desert Locust in the Central Region and its 36th Executive Committee Meeting was held from 05 to 09 June in Jeddah, Kingdom of Saudi Arabia.

The 32nd Session of the CRC discussed several important technical topics in its agenda, including the Desert Locust upsurge (2019-2021) and its lessons learned to improve the countries' response capabilities; climate change impacts locust outbreaks; new technologies for improved locust survey and control operations. In addition, the Commission workplan (2022-2025) and regular financial and administrative issues will be discussed and endorsed. The Commission for Controlling the Desert Locust in the Central Region (CRC) was established in 1967 under the Article XIV of the Constitution of the Food and Agriculture Organization of the United Nations (FAO). CRC is the biggest Commission for Controlling Desert Locust that covers CRC 30 percent of the Desert Locust distribution area within 16 member countries in the Middle East, Arabian Peninsula and Horn of Africa: Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE, Yemen, Ethiopia, Eritrea and Djibouti. The Commission's mandate is to assist member countries in managing and preventing Desert Locust and to prepare for and respond to emergencies caused by it. The Commission supports developing, sharing and adapting preventive control strategies and economically and environmentally sound locust control approaches to reduce the impact of Desert Locust control on the vulnerable communities in member countries. It plays a key role in strengthening the cooperation and coordination among the members and encouraging joint activities at the national, regional and international levels, such as joint survey and control operations when necessary and feasible.

» The regional workshop for the development of a training plan for the central region Countries (CRC), Cairo, Egypt, June 27-30, 2022

Group Photo. Participants in the regional workshop for the development of a training plan for the Central Region Countries (CRC),

The Commission for Controlling the Desert Locust in the Central Region (CRC) holed the regional workshop for developing a training plan for the central region Countries (CRC), Cairo, Egypt, June 27-30, 2022. The CRC intends to strengthen this aspect of training for the benefit of its member countries by implementing a regional plan dealing with the various operational themes aimed at consolidating the preventive control strategy against the Desert Locust. The workshop was intended to allow the locust control managers of CRC member countries to discuss the national, regional and individual training that will enable consolidating the achievements and upgrading the skills of the National Locust Control Units (NLCU) concerning the technical and scientific innovations and, on establishing the monitoring and evaluation system to be put in place to ensure better monitoring and evaluation of the training and the use of the pedagogical tools. It was agreed to implement more than 100 training programs focusing on three essential topics: survey, control, environmental health and safety standards. These included national, regional and interregional training, including a Master's program in Desert Locust Management.

Arab Society for Plant Protection News

The 13th Arab Congress of Plant Protection 2022

Important Dates to note:

1. The new congress date is October 16-21, 2022.
2. Registration deadline: September 1, 2022.
3. Deadline for hotel booking:September 31, 2022.
4. The email address and the website of the congress info@acpp-aspp.com and www.acpp-aspp.com We look forward to meeting you all in the fall of 2022 in Tunisia.

Conference Preparations Meeting

To follow up on the preparations for the conference and prepare the program and summaries, Dr. Safaa Kumari, member of the Executive Committee of the Society, and Dr. Asma Najar, Chairperson of the Organizing Committee of the Conference and Member of the Organizing Committee, Dr. Hajer Benghanem, visited Shatt Maryam on July 24,2022 to meet with the members of the Scientific Committee of the Conference Dr. Megda Daami-Remadi and Dr. Ikbal Chaib, where the preparations for abstracts were discussed. The program for oral and poster presentations, solving printing problems, financial facilities, and financial obstacles facing the conference committees.

Keynote Address and Symposia Program13th ACPP, 16-21 October, 2022, Hammamet, Tunisia

Monday, October 17, 2022 (Opening Session)

Keynote address: Plant health vision for the 21st century: New knowledge and approaches. Dr. Sophien Kamoun, the Sainsbury Laboratory, Norwich, UK.

Symposium I: Plant Health for Food Security and Safety

1. Mycotoxins as a hidden threat for food and feed safety: risks and challenges. Dr. Antonio Logrieco, CNR, Bari, Italy.
2. Importance of phytosanitary regulations and international standards for plant health to enhance food security. Dr. Nico Horn, EPPO, Paris, France.
3. Conservation and use of global plant genetic resources for enhancing insect pests and disease resistance: major foliar diseases of barley as an example. Dr. Ahmed Amri, ICARDA, Rabat, Morocco.

Tuesday, October 18, 2022

Symposium II: Advances in Molecular Plant Protection and its Applications in Pest Management

1. Tomato Plants - Trichoderma-Phytophthora nicotianae, a Complex Interaction System for Understanding plant defence mechanisms. Dr. Santa Olga Cacciola, Department of Agriculture, Food and Environment (Di3A), University of Catania, 95123 Catania, Italy.
2. Parasitoid pre-adaptation improves biological control of symbiont-protected aphids. Dr. Christoph Vorburger, EAWAG, Swiss Federal Institute of Aquatic Science and Technology and Institute of Integrative Biology, Switzerland.
3. Moleular techniques for mites characterization and their use in the biological control of pests. Dr. Marie-Stephane Tixier, Montpellier SupAgro, France.

Wednesday, October 19, 2022

Agricultural-Touristic Trip

Thursday, October 20, 2022

Symposium III: Research and Innovation for Sustainable Crop Protection

1. The challenges of automatic counting and identification of insect threats using smart technology.
2. Dr. James Bell, Rothamsted Research, Harpended, United Kingdom.
3. Metabolic approaches for citrus greening management. Dr. Nabil Killiny, University of Florida, USA.
4. How to cope with resistance to insecticides to improve pest management. Dr. Emanuele Mazzoni, Department of Sustainable Crop Production, Università Cattolica del Sacro Cuore, Italy.

Friday, October 21, 2022

Symposium IV: Application of Behavioral Control Tools as a Safe and Effective Alternative in Pest Management

1. New technologies for behavioral manipulation of insect pests. Dr. Shakir Al-Zaidi, Russell IPM, UK.
2. Manipulation of plant pests host-finding and acceptance behavior: Practical applications in IPM. Dr. Baldwyn Torto, ICIPE, Nairobi, Kenya.

CONFERENCE SPONSORS

From an early age, the Islamic Development Bank (IsDS) used to support the conferences of the Arab Society for Plant Protection as a Diamond sponsor supporting researchers from countries where their income is limited to bear the bulk of the expenses of their participation in scientific conferences. The ASPP and the conference organizing committee expressed profound thanks to IsDS for remaining as a Diamond sponsor since the previous events. The International Center for Agricultural Research in the Dry Areas (ICARDA) and Sipcam for Agricultural Materials showed generous giving to support the conference in the Gold category. To the Arab Center for the Studies of Arid Zones and Dry lands; Arab Organization for Agricultural Development and Russell IPM, and many others who supported ACPP, a heartfelt thanks for every bid that pushes the path of the Arab Society for Plant Protection and the conference, which is unique this year in Tunisia, the bride of the Mediterranean.

Abd-Al Rahman Moukahel Wins the Young Scientists Poster Award in MPU22

During the 16th Congress of the Mediterranean Phytopathological Union (MPU 2022) held in Limassol, Cyprus, during 4-8 April 2022, it was announced that the scientific poster presented by Mr **Abd-Al Rahman Moukahel** was selected for the young scientist poster award out of 63 posters presented. Mr Moukahel is a Research Assistant at Seed Health Laboratory of the International Center for Agricultural Research in the Dry Areas (ICARDA) in Lebanon, and he is an active member of the Arab Society for Plant Protection. Moukahel's poster entitled **"Characterization and distribution of *Pseudomonas syringae* pv. *syringae* on wheat in Syria"** illustrates the occurrence and distribution of an important bacterial wheat leaf disease in wheat fields in Syria. Diseases caused by this pathogen have been reported to reduce annual wheat production by around 10% and can reach 40% in severe infections occurring early in the growing period. The disease distribution in Syria was investigated, in addition to studying the biochemical and molecular characterization using specific primer pairs. This study was conducted under the supervision of **Dr Safaa Kumari** (Head of Seed Health Lab., ICARDA; and Member of the Executive Committee of the Arab Society of Plant Protection) in collaboration with Syrian scientists (**Dr Mohammed Kassem**, Faculty of Agriculture, University of Aleppo and **Dr Nader Asaad**, General Commission for Scientific Agricultural Research, Al-Ghab, Hama). Wheat (*Triticum* spp.) is a major staple food for human consumption in Syria and the Middle East. Climate change models predict more frequent and prolonged drought events worldwide, which will put extraordinary pressure on the distribution and importance of wheat diseases. For more information, you can find the abstract on page # 229 in the following link: View of Abstracts of invited, oral and poster papers presented at the 16th Congress of the Mediterranean Phytopathological Union, April 4–8, 2022, in Limassol, Cyprus | Phytopathologia Mediterranea (fupress.net)

Session Title: Disease of Major Food Crops in the Eastern and Southern Mediterranean Region and their Control

Fusarium Head Blight and Crown rot Diseases of Wheat in Algeria and other Southern Mediterranean Countries: Distribution, Identification and Pathogenicity of Associated Species.

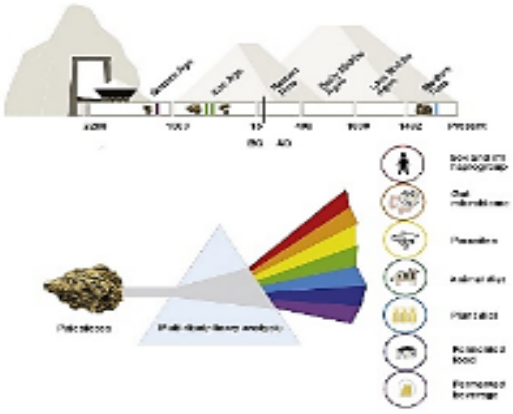
Fusarium head blight (FHB) and crown rot (CR) of wheat are worldwide serious diseases which may affect yield and also kernel contamination by mycotoxins. FHB occurs when prolonged wet weather coincides with anthesis. CR is a chronic problem where dry climatic conditions are present and when continuous wheat cropping is adopted. In the southern Mediterranean countries, climatic conditions are conducive for both diseases that can coexist. In Algeria, CR is more widespread because wheat is grown much more in arid and semi-arid regions, whereas FHB is restricted to humid and sub-humid stages where CR is present. In Tunisia, FHB was reported only in the bioclimatic sub-humid and semi-arid upper stages. Based on published data, in Algeria, *Fusarium culmorum* was reported as the dominant species associated to both diseases with *F. pseudograminearum* as the second causal agent; while in Tunisia, the same data were recorded for CR, but for FHB, the dominate species was *Microdochium nivale* followed by *F. culmorum.* In Morroco and Egypt, *F. culmorum* and *Bipolaris sorokiniana* were reported as major species associated with CR. In addition, *Rhizoctonia oryzea* was associated with CR and *F. graminearum* to FHB in Egypt. Pathogenicity assessments have shown that in Algeria, *F. culmorum* was the most aggressive on the wheat seedlings and the head, while *F. pseudograminearum* was the most aggressive on the crown. In Tunisia, *F. culmorum* and *F. pseudograminearum* were the most aggressive on the crown, and in Egypt *F. culmorum* was also the most aggressive. **[Abstract of Dr Houda Boureghda from The National Higher School of Agronomy (ENSA), El Harrach, Algiers, Algeria at the Arab society of Plant Protection Session (ASPP) in the 16th MPU congress held in Limassol Cyprus 4th to 8th 2022].** hou.boureghda@gmail.com

Mohamed Sarhan did a Bachelor's degree in biotechnology, a microbiology Master's, and a master's diploma in integrated pest management at Cairo University and Leibniz-IGZ and Bari's CIHEAM-IAMB. He received his PhD in Agronomy and plant-microbe interactions from the University of Rostock. Later, he joined the Institute for Mummy Studies at Eurac Research, Bolzano, Italy, to work in the field of ancient DNA and microbiomes of human mummies.

What is ancient DNA?

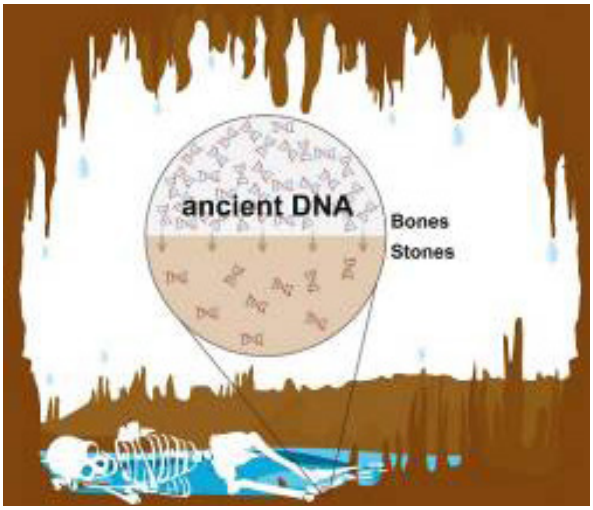
Ancient DNA (aDNA) is the DNA extracted from ancient samples and remains. It can be from hundred-millions of years-old specimens. The beginning of this field was linked to studying Egyptian mummies and then evolved in a different direction, e.g., ancient human DNA, ancient microbial DNA, and ancient plant DNA. In general, studying ancient DNA can provide insights into the past on the genomic level, understanding human migration, animal domestication, pathogen evolution, plant adaptation, … etc.

Studying ancient human excrements



One of the great potentials of the aDNA field is analyzing the ancient human feces (or what so-called paleofeces or coprolites), which can provide excellent information on the gut microbiome and diet of our ancestors and hence give insight on their health status and dietary habits. In a recent study, we analyzed paleofeces from different samples from the Bronze Age, Iron Age, and Baroque times from the Hallstatt salt mines of Austria. By analyzing those samples and reconstructing parts of the chromosomal, mitochondrial, and chloroplast DNA, we were able to reconstruct the ancient microbiome, plant-based and animal-based dietary components, and human parasites. Additionally, we could provide an insight into the food processing techniques they developed during the Iron Age by reconstructing the completed genomes of the fungi *Saccharomyces cerevisiae* and *Penicillium roqueforti*, and by comparing the genomes of those two fungi with their modern relatives, we found strong indications for being used in food fermentation, most likely fermenting beer and blue cheese, respectively.

Less destructive sampling of human remains



We are now working on improving the sampling of the human remains to make it as least destructive as possible to better preserve the cultural heritages and consider the ethical concerns. For that purpose, while we analyzed human skeletal remains from a water cave in Germany, we also examined the calcite layer surrounding the analyzed bone fragment. We reconstructed a complete human mitochondrial genome from the calcite layer, identical to the mitochondrial DNA reconstructed from the bones. This finding offers one additional resource of ancient DNA and encourages researchers to look for more innovative sampling approaches other than drilling or cutting pieces of human remains.

My current research is analyzing the ancient gut microbiome of the Iceman mummy in Italy (5300 years-old mummy known as Ötzi), and I will keep you posted on the results and the updates.

Publications

Maixner F, Mitterer C, Jäger HY, **Sarhan MS**, Valverde G, Lücker S, Piombino-Mascali D, Szikossy I, Molnár E, Pálfi G, Pap I. Linear polyacrylamide is highly efficient in precipitating and purifying environmental and ancient DNA. ***Methods in Ecology and Evolution***. 2022 Mar; 13(3):653-67. DOI. 10.1111/2041-210X.13772

Sarhan MS, Lehmkuhl A, Straub R, Tett A, Wieland G, Francken M, Zink A, Maixner F. Ancient DNA diffuses from human bones to cave stones. ***Iscience***. 2021 Dec 17; 24(12):103397. DOI. 10.1016/j.isci.2021.103397

Maixner F, **Sarhan MS**, Huang KD, Tett A, Schoenafinger A, Zingale S, Blanco-Míguez A, Manghi P, Cemper-Kiesslich J, Rosendahl W, Kusebauch U. Hallstatt miners consumed blue cheese and beer during the Iron Age and retained a non-Westernized gut microbiome until the Baroque period. ***Current Biology***. 2021 Dec 6; 31(23):5149-62. DOI. 10.1016/j.cub.2021.09.031

El-Soda M, **Sarhan MS**. From Gene Mapping to Gene Editing, A Guide from the Arabidopsis Research. ***Annual Plant Reviews online***. 2021 Sep 14; 4(3):733-66. DOI. 10.1002/9781119312994.apr0765

El-Wahab, AMH, Aljabri, M, **Sarhan, MS**, et al. (2020). High-density SNP-based association mapping of seed traits in fenugreek reveals homology with clover. ***Genes***, 11(8), 893. DOI. 10.3390/genes11080893

Sarhan, MS; Hamza, MA; Youssef, HH; Patz, S; Becker, M; et al. (2019). Culturomics of the plant prokaryotic microbiome and the dawn of plant-based culture media–A review. ***Journal of Advanced Research***. DOI: 10.1016/j.jare.2019.04.002

The 4th International Conference of the Arab Beekeeping Association (ApiArab)

ApiArab was held under His Royal Highness Prince Dr. Hussam bin Saud bin Abdulaziz Al Saud on 16-19, July 2022 in conjunction with the 14th international honey festival in Albaha, Saudi Arabia, on 15 -29, July 2022. The conference of ApiArab raised the slogan of "Better bee management practices for Sustainable Beekeeping" discussed several topics, including bee management, honeybees genetic improvement. The mechanisms to enhance the value-added honeybee products in arid areas, and organized several workshops that discussed issues related to the development of beekeeping and honey production, training programs in Apitherapy, Apimedicne, and honey sensory analysis. A group of beekeeping scientists worldwide attended the conference, allowing the exchange of information and expertise, and a constructive and fruitful discussion on the challenges faced by beekeepers in arid environments, and ways to overcome them to promote the beekeeping and honey production industries of the arid regions and its sustainability. From the Arab society of plant protection, **Dr. Raied Abou Kubaa, researcher at the National Research Council (CNR) of Italy, Institute for Sustainable Plant Protection (IPSP) presented a lecture entitled *»Honey bee viruses, diagnosis, molecular detection and managements«***

Controlling of Xanthomonas axonopodis pv. phaseoli by Induction of Phenolic Compounds in Bean Plants using Salicylic and Benzoic Acids

This study deals with the potentiality of salicylic (SA) and benzoic (BA) acids for controlling the common blight of beans (CBB) caused by *Xanthomonas axonopodis* pv. *phaseoli* (Xap). Impacts of the application of SA and BA (1.2 µg mL−1) on the plant biological parameters, bacterial count, disease severity, phenolic and salicylic acid contents as well as catalase activity in treated plants were investigated. In vitro, the application of both compounds at different concentrations (0.4, 0.8, and 1.2 µg mL−1) significantly suppressed the growth of the pathogen. Under greenhouse conditions, the application of BA and SA considerably reduced the disease development by 81 and 71%, respectively, after four days of the application as compared to the infected control. After 12 days of BA application, plants were protected 49.2% from the disease compared to SA (44.6%). SA-treated plants showed significant increases in the SA content and total phenolic content. Also, BA-treated plants showed an increment in the total phenolic content. Bean plants treated with SA showed higher catalase activity than those treated with BA. In conclusion, this study supports using SA and BA as abiotic elicitors to protect bean plants from the common blight disease. This protection may be attributed to the resistance induction, activation of defence enzymes as well as augmentation of the phenolic content and salicylic acid in the host cells. **[Abo-Elyousr K.A.M., Imran M., Almasoudi N.M., Ali E.F., Hassan S., Sallam N.M.A., Youssef K., Abdel-Rahim I.R., Khalil Bagy H.M.*(Egypt), King Abdulaziz University, University of Assiut, Taif University, Plant Pathology Research Institute, Egypt, Journal of Plant Pathology, 2022].**

DOI: 10.1007/s42161-022-01102-5

Post-harvest Diseases of Fruit and Vegetable: Methods and Mechanisms of Action.

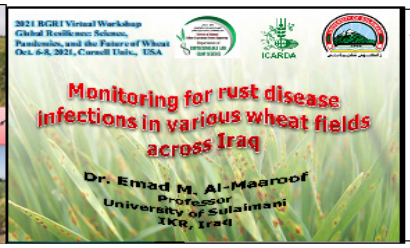
Post-harvest losses of fruit and vegetables are very high and sometimes reach 50% and more in some developing countries due to pathological and physiological deterioration. This loss is due to inappropriate handling and lack of the proper methods and means to prevent diseases. Fruits and vegetables are susceptible to severe losses caused by several plant pathogenic fungi, including *Botrytis cinerea, Alternaria alternata, Penicillium italicum, P. digitatum, P. expansum, Monilia fructicola, M. laxa, Colletotrichum gloeosporioides, Rhizopus stolonifer, Botryiodiplodia theobromae etc.*, after harvest. Chemical fungicides are the primary means to control such diseases. However, several constraints have limited their use, including fungicide resistance, market pressure regarding residues, and environmental and human health concerns. In this context, safe alternative means to control post-harvest diseases of fruits and vegetables are needed to be developed. Several investigations have documented the strong antimicrobial activity of various options, including biological control using antagonistic microorganisms, physical means such as low temperatures, modified and controlled atmospheres, heat, irradiation, and generally regarded as safe (GRAS) substances such as salts, sanitizers, plant extracts, and essential oils. Also, many efforts have been made to understand their mode of action to improve their use, especially at large scale in the field. The aim of this Research Topic was to present the latest results of controlling post-harvest diseases of fruit and vegetables using new alternative control means and understanding their mechanism of action. Eleven articles were accepted for this Research Topic dealing with table grapes, strawberries, avocados, mangoes, papayas, apples, and pears**. [Youssef K.,(Egypt), Ippolito A., Roberto S.R., Plant Pathology Research Institute, Egypt, University of Bari Aldo Moro, Bari, Italy, State University of Londrina, Londrina, Brazil, Frontiers in Microbiology, 13:900060, 2022].**
https://doi.org/10.3389/fmicb.2022.900060

Use of Lures with a Mix of Sweet and Fetid odors for Catching Musca domestica L. in Domestic Environments

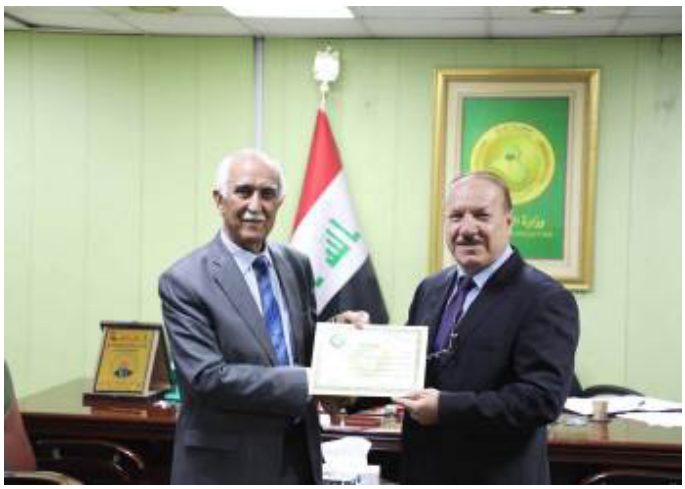
The housefly, Musca domestica L. (Diptera; Muscidae), is an insect closely associated with human activities in urban and rural environments and is thus a crucial factor in the transmission of various fecal–oral pathogens. The use of traps for monitoring and controlling these species indoors is often limited by the fetid nature of the chemical attractants commonly used. A recent study demonstrated the attraction of houseflies to terpenoids, which are perceived by humans as a sweet odor. The aim of this study was to test pleasant-smelling compounds such as terpinolene, α-terpinene and linalool mixed with others (acetic, butyric, isovaleric and hexanoic acid, indole and dimethyl trisulfide) known to attract houseflies to obtain a lure that could be acceptable in domestic environments. Experiments were carried out in the laboratory, using olfactometer, and in two rooms of 32 m3 and 108 m3, each resembling domestic environments using trap bioassays. The results showed that the volatile blend elicited attraction in the olfactometer and increased the number of flies captured by the traps. In the smaller room, the lure demonstrated efficacy for two weeks from the start of the experiment, while in the larger room, the number of captured flies was higher than in the control traps only during the first week. The results confirmed the attraction of the flies to the traps baited with the blend, the application of the lures in domestic environments can be considered as a new alternative tool for trapping this pest. [Salvatore Guarino1 Marco Caimi2 Mokhtar Abdulsattar Arif3 (Iraq), Pietro Zito2. 1Institute of Biosciences and Bioresources (IBBR), National Research Council of Italy (CNR), Corso Calatafmi 414, 90129 Palermo, Italy. 2GEA S.R.L. via Enrico Fermi, 1020019 Settimo Milanese (MI), Italy. 3Plant Protection Directorate, Ministry of Agriculture, Abu-Ghraib 10081 Baghdad, Iraq, International Journal of Tropical Insect Science,42:2709–2715, 2022]**.** https://link.springer.com/article/10.1007/s42690-022-00801-x

Participation in the Borlaug Global Rust Initiative Technical Workshop (BGRI 2021), USA.

Dr. Emad Mahmoud Al-Maaroof, The Arab Society for Plant Protection Member from the University of Sulaimani, Iraq, participated in the Borlaug Global Rust Initiative Workshop organized by Cornell University in collaboration with the BGRI program. The workshop was held virtually during the period 6-8/10/2021 with the participation of the best world wheat rust scientists. The scientific workshop program included 30 oral presentations and 41 posters presented within five main scientific sessions. Dr. Emad Al-Maaroof delivered a presentation through this workshop entitled “Monitoring for rust disease infections in various wheat fields across Iraq” within Forecasting Biotic and Abiotic Stresses session. On the sideline of the workshop, a meeting was attended on the surveillance and monitoring of rust pathogens on October 6, during which the latest developments were presented regarding the spread of the dangerous race Ug99, the causal agent of black stem rust disease and its lineage group members in addition to other new races of other rust pathogens worldwide through 11 presentations.



Scientist Award



The Iraqi Ministry of Agriculture recognized Prof. Dr. **Emad Mahmoud Al-Maaroof** as a distinguished scientist, who is a member of the Arab Society for Plant Protection and cereals diseases professional at the Department of Biotechnology and field Crops at the College of Agricultural Engineering Sciences/University of Sulaymaniyah, for his outstanding work in developing two new promising disease resistant and drought tolerant bread wheat cultivars in addition to one Triticale cultivar registered at the National Committee for the Registration, Accreditation, and Protection of Agricultural cultivars, chaired by the Minister of Agriculture. The honor was presented through the Ministry's advisor, Dr Mahdi Damad Al-Qaisi, who confirmed that this action is intended to encourage researchers to protect their rights to develop agricultural varieties, the rights of the research institution, as well as preserve the plant wealth of the agricultural sector. For more information, visit the Ministry's website at the link. http://zeraa.gov.iq/index.php?name=News&file=article...

The Second Scientific Days of the Phytopathology and Molecular Biology Laboratory (LPBM) - Department of Botany - The National Higher School of Agronomy, Algeria

The Laboratory of Phytopathology and Molecular Biology organized its second scientific day on June 26 and 27, 2022. These scientific days are dedicated to the memory of the late Professor Meriem LOUANCHI, phytopathology teacher at the department of botany and the former head of the laboratory, who passed away one year ago.

The Main Objectives of These Days are

(i) Presenting the research activities developed by the various teams in the laboratory

(ii) The valorization of the research results of the PhD thesis projects

(iii) Informing the institute's scientific community on the research work carried out at the phytopathology and Molecular Biology laboratory.

The scientific days took place over two days on June 26 and 27, with plenary conferences and oral and poster communications. Fifty-three research papers, including ten conferences, 17 oral communications and 26 posters, were presented during these scientific events. The conferences focused on the most important diseases in Algeria, the means of control, and the resistance methods. These conferences reflecting the topics of the laboratory's research teams gave a general introduction of the research activities of the teacher-researchers and the PhD and master's students presented as oral and poster communications. The research papers presented are related to the research activities of the phytopathology and molecular biology laboratory: the identification and characterization of fungal, bacterial and viral pathogens affecting strategic crops in Algeria: cereals, field crops and perennial crops, as well as abiotic stresses affecting crops (drought and salinity). Diseases, mean management used, chemicals and biological were also presented during these days. It should be emphasized that the laboratory gives great importance to alternative means of control, such as biological control through the use of microorganisms and plant extracts, for use as a part of integrated control management safe and respectful for the environment. **[Houda Boureghda (Algeria), 2022].**

XYLELLA FASTIDIOSA NEWS

» European Project BIOVEXO "Biocontrol of Xylella and its Vector in Olive Trees for Integrated Pest Management

Within the framework of the European project BIOVEXO "Biocontrol of Xylella and its vector in olive trees for integrated pest management," which explores innovative biopesticides that target the #Xylella_fastidiosa pathogen, which threatens olive and almond production in the #EU and the #Mediterranean_region, a scientific forum was organized at Maya Hotel in Alicante, Spain from 20-22 April 2022 where experts from Italy, Spain, Austria, Belgium, and Slovenia discussed the latest findings of the project, the current situation, measures, opportunities and proposed solutions at the European level. The forum also included a field visit to almond orchards in the demarcated area in Alicante, Southern Spain, and to the experimental fields of BIOVEXO project, which will be used to evaluate the effectiveness of the proposed innovative biopesticides on almond trees in a preventive and curative way, as it is currently being used on olive trees in the Apulian Region (Italy) and in Mallorca (Spain). As an ASPP member, **Dr. Raied Abou Kubaa** from the IPSP, CNR, Italy, has participated in this forum.

» Project: Capacity building and awareness raising in Europe and third countries to deal with *Xylella fastidiosa*

Within the framework of the project: Capacity building and awareness-raising in Europe and in third countries to deal with *Xylella fastidiosa*, which is funded by the European Union H2020 (Marie Sokolowski-Curie Actions (MSCA) Call for Research and Innovation Staff Exchange (RISE): H2020-MSCA-RISE- 2016). Project number: 734353, from 21 June to 23 July 2022, researchers representing Palestinian universities and the Agricultural Research Centre NARC, in partnership with the Mediterranean Agricultural Institute CIHEAM-Bari have organized a training workshop. The training workshop was held over three days and included laboratory and field activities. About 80 male and female researchers participated in this workshop, which included visiting olive, grape, and almond orchards in the city of Jenin. During which the trainees were introduced to the methods of collecting and preserving samples and then analysing them later in the laboratory by several serological and molecular methods. The training workshop also included several theoretical and practical lectures aimed at enhancing the ability of Palestinian researchers and inspectors to deal with bacterial diseases if found in Palestine. It is noteworthy that the Cure project includes several partners in Europe and the Middle East and is managed by Dr. Maroun El-Mujabber of the Mediterranean Agricultural Institute in Bari.

» *The 14th International Conference on Plant Pathogenic Bacteria (ICPPB)*

ICPPB was taken place in Assisi (PG) in Italy from July 3 to 8, 2022. The conference's mission was to promote and disseminate the latest scientific advances in all aspects of phytobacteriology and encourage dialogue and collaboration between researchers. The latest developments in the field, either basic or applied, were successfully presented and discussed at the conference. From the Arab Society for Plant Protection (ASPP), Dr Raied Abou Kubaa, a researcher at the Institute for Sustainable Plant Protection (IPSP) – CNR, Bari, Italy, and Dr Nader Ashmawy, Head of Plant Pathology Department, University of Alexandria, Egypt and Dr Sahar Abdelrazek, researcher at the Research Associate Virginia Tech, Blacksburg, USA, participated with the following researches:

1- Investigations on plant-associate bacteria with inactive crown galls of grapevine in Lebanon.
2- Genomic and physiological basis of resistance to *Xylella fastidiosa* in olive.
3- *Xylella fastidiosa* infections reveal different physiological responses in resistant and susceptible olive cultivars.
4- Isolation and molecular characterization of some Egyptian isolates of *Agrobacterium tumefaciens*.
5- Characterization of the fire blight pathogen*, Erwinia amylovora,* using short sequence DNA repeats (SSRs) of plasmid pEa29 Characterization of *Xyllela fastidiosa* population in Virginia using metagenomics.

GENERAL NEWS

Review of Bioenergy Potential from the Agriculture Sector in Iraq.

Bioenergy is one of the most important renewable energy sources worldwide, accounting for over two-thirds of the renewable-energy mix. Biomass accounted for 13–14% of the primary energy consumption in 2018, and by 2050, it is expected to account for 50% of the global primary energy consumption. This article studies the biomass potential in Iraq. The potential of this country to be one of the leading bioenergy producers is discussed, remarking on the importance of agricultural crop waste. Nowadays, Iraq generates a significant quantity of biomass every year. Unfortunately, these wastes are burned directly instead of contributing to the energy industry and economic progress, potentially causing a slew of environmental issues. Based on earlier studies, the theoretical energy potential of Iraq's agricultural wastes is assessed. It is concluded that 10 million tons of dry agricultural leftovers can create 115 PJ of energy per year. According to the findings of this study, 10 million heads of cattle in Iraq could generate 72 million m^3 of biogas per day, with a total potential power of 946 TJ per year from animal wastes, mainly cattle dung. On the other hand, bioenergy potential relies heavily on the geographical distribution, availability, and accessibility of real waste. Wasit, Qadisiyah, and Mosul are the most feasible locations for this agricultural waste potential. This might lead to developing a long-term economic plan to successfully and sustainably utilize substantial accessible waste for bioenergy generation. **[Hend Dakhel Alhassany[1], Safaa Malik Abbas[1], Marcos Tostado-Véliz [1]*David Vera[1], Salah Kamel[2,] and Francisco Jurado[1] (Iraq), [1]Department of Electrical Engineering, University of Jaen, 23700 Linares, Spain. [2]Department of Electrical Engineering, Faculty of Engineering, Aswan University, Aswan 81542, Egypt 2022].**

Hend Dakhel Alhassany is an engineer who works in the supervision and implementation of the projects of government institutions in Karbala, Iraq. She holds a master's in engineering and currently pursuing a PhD in Optimization and control of energy generation processes with alternative sources at the University of Jaen. She published two scientific articles this year hda00001@red.ujaen.es

Supplement 1-Compendium on the Plant Health Research Priorities for the Mediterranean Region

D'onghia, Anna Maria; Abrantes, Isabel; Al-Jboory, Ibrahim; Anfora, Gianfranco; Bertaccini, Assunta; Choueri, Elia; Cubero, Jaime; Horn, Nico; Kalogeropoulou, Eleni; Laala, Samia; Mugnai, Laura; Porcelli, Francesco; Sedra, Moulay Hassan; Sumner-Kalkun, Jason; Valentini, Franco; Yahiaoui, Dorsaf; Yurtmen, Melike; Giovani, Baldissera The Compendium on the 'Plant Health Research Priorities for the Mediterranean Region', published in 2020 to celebrate the International Year of Plant Health (IYPH), was the first joint Euphresco and CIHEAM Bari initiative launched to improve the coordination of research efforts (from research funding to research activities) on plant health and plant protection in the Mediterranean region and to enhance cooperation of stakeholders within the area. The compendium was prepared on the basis of information and views collected from national experts from the Balkan-Mediterranean, Eastern Mediterranean, Maghreb, and Western Mediterranean sub-regions on the important pests, the research priorities, the research infrastructures, and the capacity. This supplement is an update of the Compendium. It contains the experts' indications of the research needs for the priority pests listed
in organizations involved in phytosanitary research. The supplement also details the phytosanitary problems for which the Mediterranean countries share the same interest and should be addressed in the short term. https://zenodo.org/record/6805519#.Ysa6GHZBy71

Implementation of the Project "Strengthening the Resilience and Peaceful coexistence of Lebanese and Syrian refugees through increased income generation in the agricultural and food production sectors "in Lebanon.

RET Germany e.V, in partnership with GATE Lebanon local Non-Governmental Organization (LNGO) and the Lebanese Agricultural Research Institute (LARI), is implementing a transitional development project in Baalbek-Hermel Governorate: Strengthening the resilience and peaceful coexistence of Lebanese and Syrian refugees through increased income generation in the agricultural and food production sectors. The project is funded by the Federal Ministry for Economic Cooperation and Development (BMZ) of the Federal Republic of Germany through RET Germany (INGO, Berlin). It will be implemented for three years (2021- 2024). The project targets vulnerable Lebanese and Syrian refugee households and communities in multiple rural areas of the Baalbek-Hermel Governorate that are heavily dependent on agriculture, particularly vulnerable people who are facing poverty and food insecurity due to low agriculture productivity and profitability and are unable to secure their livelihoods. The project supports (1) **Lebanese fruit and fish farmers** to increase their agricultural/aquacultural productivity and (2) **Syrian and Lebanese farm workers** to promote decent employment and livelihood opportunities. The project pays particular attention to young people, women, and households with family members with a disability. Within the framework of the project, GATE Lebanon, in coordination with LARI, and partnership with RET, organized numerous farmers' training in the Governorate of Baalbek-Hermel. The training covered the management of multiple crops, including cherry, apricot, grape, apple, and olive trees. Over 365 farmers attended the pruning and Integrated Pest Management (IPM) training during the eight-month training. More than 175 agricultural workers participated in the harvest and post-harvest techniques training. The training objective was to raise awareness of the use of technology in agriculture management amongst the Lebanese and Syrian farmers and agricultural workers. Farmers were introduced to the **LARI-LEB Application**, a digital tool that provides an early warning system and timely news to detect an early infestation of pests and diseases and provides them with the weather forecast. With the App, farmers can make a timely decision on treatment in their farms. Farmers were also trained on good techniques for pruning to increase their trees' productivity, maintain their health, maximize fruit size, and make harvest more manageable. Workers were also trained on proper harvesting and post-harvesting techniques to improve fruit quality and diminish disease transmission in the supply chain. In-kind support was also provided to the participants, including agricultural kits and winter jackets. The training set provided farmers and workers in the region with technical assistance; more importantly, it introduced a digital farming tool to enhance production, thus increasing overall food security, building resilience, and improving livelihoods. Thanks to the generous support of the Federal Ministry for Economic Cooperation and Development (BMZ) of the Federal Republic of Germany through RET Germany e.V. (INGO, Berlin) and in partnership with GATE Lebanon (LNGO) and LARI. **[Zinette Moussa – LARI Project Coordinator; Ayham Esmaiel - RET Germany Livelihood Specialist, 2022].**

National Centre for Palms & Dates Prize

National Centre for Palms & Dates Prize stimulates original and impactful research along the entire date palm value chain to accelerate innovations, improve date palms productivity, and enhance date quality to strengthen sustainable date palm production systems. This international prize is launched with a vision to achieve excellence and promote date palm industry worldwide by encouraging **ENTITIES** (Government/Private); **RESEARCHERS,** and **YOUTH** involved in the date palm sector, who apply their expertise and develop impressive solutions with lasting impact in date palm sector. The NCPD prize will be awarded annually that could bring exciting new Scientific and technical advances in the date palm sector. The National Centre for Palms and Dates looks forward to reviewing the outstanding innovations and research findings from future entrants.

- **Date Palm Young Pioneer Entrepreneurship Prize** winner will receive 100,000 Saudi Riyals (Individuals)
- **The best Scientific Research Prize** winner will receive 200,000 Saudi Riyals (Individuals)
- **Date Palm Innovative Technology Excellence Prize** winner will receive 200,000 Saudi Riyals (Entities)
- **Aims**
- Honoring scientific bodies, researchers, innovators, and farmers in the field of palm cultivation and date production and protection
- Encouraging innovations and their practical applications to reduce costs, improve farm management, and increase production quality by the use of Modern technologies in the care and production of palm trees
- Improving the level of date production at the local, regional and global level
- Directing those interested in the palm sector and date production to address the challenges facing the sector and related industries
- Achieving the Kingdom's Vision 2030 about the sustainability of natural resources and protecting food security

Eligibility to Apply for the Prize
The prize is open to all residents of all the countries and stakeholders. The work submitted for the award must be original and performed by the entrant. The entrants must have performed the work described. The winners of any round may not re-apply for candidacy until after the passage of three years.

NCPD Prize Categories
1. Date Palm Young Pioneer Entrepreneurship Prize
- Early career Young Pioneer Entrepreneurs at the age of ≤ 30 years

2. Best Scientific Research Prize
- Scientists with innovative and creative studies in the field of date palms

3. Date Palm Innovative Technology Excellence Prize
- Universities / Research centers / private companies / Organizations / Startups that develop impressive practical solutions and innovative technologies with lasting impact in the date palm sector.
- Note: In case of prize application for **Date Palm Innovative Technology Excellence Prize,** No self-nomination will be considered, as it is only intended for ENTITIES.

Application Process and Terms of Conditions
The entrants will complete an online application entry form.
- The candidates applying under the category "**Date Palm Young Pioneer Entrepreneurship Prize**" should submit any proof of their Entrepreneurship.
- The applicants under the category **Best Scientific Research Prize** must share No Objection Certification from the employer. Moreover, applicants must provide us with an undertaking on their institute letterhead that findings/innovations submitted to the scientific committee are solely from his/her research. The applicant may optionally submit one to three additional scientific articles associated with the proposed theme.
- The nominations for the **Date Palm Innovative Technology Excellence Prize** must be submitted by the head of the entity (Universities / Research centers / private companies / Organizations / Startups.
- The submission will only be Arabic and English language
- For all NCPD prize categories, nominees' themes must not already be used for other awards and previous national or international competitions.
- All application files will be kept at the headquarters of the NCDP prize secretariat in the strictest secret and must not be returned to candidates, whether they are winners or not.
- The applicant specifies the framework in which the work was carried out and the potential and active partners, as well as the source(s) of financing

Important Dates:
- The application portal will be open on the 1st of June, 2022
- The deadline to apply for the prizes will be 30th September 2022
- Winners will be announced in November/December 2022. https://ncpd.org.sa/services/prize1

Prize registration https://ncpd.org.sa/user-register

Selected Research Papers

- **Occurrence of *Macrophomina phaseolina* in Israel: Challenges for Disease Management and Crop Germplasm Enhancement.** Roni Cohen, Meital Elkabetz, Harry S. Paris, Amit Gur, Nir Dai, Onn Rabinovitz, and Stanley Freeman, Published Online:20 Jan 2022. https://doi.org/10.1094/PDIS-07-21-1390-FE
- **An Improved Technique for Isolation and Characterization of Single-Spore Isolates of Plasmodiophora brassicae.** Mingcan Lv, Yifan Liu, Yue Wu, Jing Zhang, Xuyao Liu, Ruiqin Ji, and Hui Feng, Published Online:3 Dec 2021. https://doi.org/10.1094/PDIS-03-21-0480-RE
- **Use of metalaxyl against some soil plant pathogens of the class Peronosporomycetes – A review and two case studies.** Matěj Pánekorcid , Asad Aliorcid , Štěpán Helmerorcid, Plant Protect. Sci., 58: 92-109. 2022. https://doi.org/10.17221/42/2021-PPS
- ***Trichoderma asperellum* (NST-009): A potential native antagonistic fungus to control Cercospora leaf spot and promote the growth of 'Green Oak' lettuce (*Lactuca sativa* L.) cultivated in the commercial NFT hydroponic system.** Athakorn Promwee, Warin Intana, Plant Protection Science, 58, (2): 139–149, 2022. https://doi.org/10.17221/69/2021-PPS
- **Effects of population density on adult morphology and life-history traits of female Mediterranean flour moth, *Ephestia kuehniella* (Lepidoptera: Pyralidae).** Santhi Bhavanam and Steven A. Trewick, Eur. J. Entomol. 119: 191-200, 2022. DOI: 10.14411/eje.2022.021
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- **Promising Insecticidal Efficiency of Essential Oils Isolated from Four Cultivated *Eucalyptus* Species in Iran against the Lesser Grain Borer, *Rhyzopertha dominica* (F.).** Asgar Ebadollahi ,Bahram Naseri ,Zahra Abedi, William N. Setzer and Tanasak Changbunjong, Insects, 13(6), 517,2022. https://doi.org/10.3390/insects13060517
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- **The Impacts of Climate Change on the Potential Distribution of *Plodia interpunctella* (Hübner) (Lepidoptera: Pyralidae) in China.** Jinyu Zhao, Chengfei Song, Li Ma, Xizhong Yan, Juan Shi, and Chi Hao, Insects, 13(7), 636, 2022. https://doi.org/10.3390/insects13070636
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- **To Every Thing There Is a Season: Phenology and Photoperiodic Control of Seasonal Development in the Invasive Caucasian Population of the Brown Marmorated Stink Bug, *Halyomorpha halys* (Hemiptera: Heteroptera: Pentatomidae).** Sergey Ya. Reznik, Natalia N. Karpun, Vilena Ye. Zakharchenko, Yelena I. Shoshina, Margarita Yu. Dolgovskaya, Aida Kh. Saulich and Dmitry L. Musolin, Insects, 13(7), 580, 2022. https://doi.org/10.3390/insects13070580

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- **Assessment of Ozone Gas Efficiency on the Biological Aspects of the Fig Moth *Ephestia cautella* on Zahdi Date**. Th.A.M. Al-Saadi and Feryal Bahjat Hermize (IRAQ).
- **Survey for Legume and Cereal Viruses in Libya.** H. Abukraa, S.G. Kumari and F. Bshia (LIBYA & LEBANON).
- **First record of circular leaf miner *Leucoptera scitella* Zell. Infestation on different hosts in Syria**. N. Diab, I. El-Joori, A. El-Monoufi and M. Ghosn (SYRIA).
- **Indirect Effect of Some Insecticides on Tomato Early Blight (*Alternaria solani*) Under Laboratory and Greenhouse Conditions.** A.A.A. Matrood, A. Rhouma and A. H. F. Al-Taie (IRAQ & TUNISIA).
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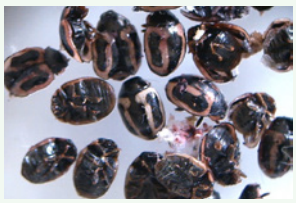
- **Effect of Cultural Filtrate of *Fusarium oxysporum.* f. sp. *tuberosi* in Some Growth Parameters of Ten Potato Varieties (*Solanum tuberosum*) *In vitro.*** E.A. Eltinawi, F. Albiski and J. Faddoul (SYRIA).
- **Study of the Factors Affecting Infestation Rate with Olive Moth *Prays oleae* (Bernard, 1788) in Three Olive Growing Locations Along the Syrian Coast**. Y. Wassouf, A. N. Bashir and Gh. Ibrahim (SYRIA).

EVENTS OF INTEREST 2022-2023

28-31/8/ 2022	IV International Agricultural, Biological & Life Science Conference, Edirne, Turkey. /https://agbiol.org
28 /8–1 /9/2022	International Conference of the German Society for Plant Sciences. Bonn- Germany. /https://www.botanik-tagung.de
31/8 – 3/9/ 2022	/IV. Balkan Agricultural Congress. Edirne, Turkey. https://www.agribalkan.net
19-23/9/ 2022	XI International Scientific and Practical Conference «Biological Plant Protection is the /Basis of Agroecosystems Stabilization». http://www.fncbzr.ru/en
21 - 23 /9/ 2022	.International Plant Health Conference, Queen Elizabeth II Centre | London UK https://bit.ly/3z2sQHP
26 – 29/9/2022	8th International Cereal Nematodes Symposium (ICNS) Abant,Turkey. https://www./cimmyt.org/events/8th-international-cereal-nematodes-symposium-icns
6-9 /10/ 2022	XIII International Agriculture Symposium AGROSYM 2022 Jahorina, Bosnia, and Herze-/govina. http://agrosym.ues.rs.ba
5-7/12/2022	First International Conference on Plant Protection in Sultan Qaboos University, Oman. https://conferences.squ.edu.om/icpp/Home

New Record of two beneficial on cochineal scale insect Dactylopius opuntiae in Jordan, 2022
Ahmad Katbeh-Bader and Ibrahim Al-Jboory



Hyperaspis trifurcata

Dactylopius opuntiae

Leucopis bellula

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

Nashwa Abd Elmonem Hamed El Morshdey(Egypt), Safaa N. Hussein (Iraq), Rezan Muhammad Salih Al (Iraq), Emad M. Al-Maaroof (Sulaimani-Iraq), Majd Jamal (Syria), Hend Dakhel Alhassany(Iraq), Abdulnabi Basheer(Syria), Haider Ali Reda Al-Ezzi (Iraq), Youssef Khamis (Egypt), Mohamed Sarhan(Egypt), Maadh Alfahd (Iraq), Amal Hussein Abdullah (Iraq), Radhi F. Al-Jassany (Iraq), Ahmed B. Abu-Duka (Iraq), Doaa Ali Fares(Iraq), Neran Salem Aljarah (Iraq), Zinette Mousa (Lebanon), Mokhtar Abdulsattar Arif (Iraq), Adnan A. Lahuf (Iraq), Abd-Al Rahman Moukahel(Syria), Mohamed elHady Sidatt (FAOSNE), Maged Elkahky (FAO),AlSaraiAlalawi Mamoon (FAORNE), Heba Tokali (FAO-Egypt), Yosra Ahmed (FAORNE), Wesam Atawneh (Palestine).

Special Thanks to Engineer Zinette Moussa from Lebanon for her great inputs in sharing news and other topics to enrich the bulletin.

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

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