

Identification of *Ditylenchus* Species Prevalent in Tomato Fields in North Khorasan Province

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ABSTRACT

To identify plant parasitic nematodes of tomato fields in North Khorasan Province during 2009 and 2010, 120 soil samples were collected from tomato rhizospheres. The nematodes were extracted from soil through centrifugal flotation technique. The extracted nematodes were transferred into glycerin. Permanent slides were mounted. The nematodes were identified through their morphological and morphometrical characteristics. A significant diversity was observed among species belonging to *Ditylenchus*. Three species of *Ditylenchus* were identified as follows: *D. acutatus*, *D. medicaginis* and *D. tenuidens* from among these species, *D. acutatus* and *D. tenuidens* were the first time reports from Iran.

Keywords: *Ditylenchus*, Identification, Iran, Nematode, North Khorasan, Tomato.

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Population Abundance, Prey Consumption and Body Size of the Predatory Bug *Orius minutus* Feeding on *Tetranychus urticae* on Six Potato Cultivars

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ABSTRACT

Two-spotted spider mite, *Tetranychus urticae* Koch, is a pest of potato crop in Ardabil region. Throughout the study, the population densities of *T. urticae* and *Orius minutus* L. were assessed on six cultivars of potato crop under field conditions during years 2011 and 2012. Also, the attraction rate and the body size of *O. minutus* were studied on six cultivars of potato infested with *T. urticae* under laboratory conditions. The lowest mite density (71.1 prey/plant) and the highest predator population (3.3 predator/plant) were recorded for Savalan. After 24, 48 and 72 hours past from release, the predators were significantly more attracted to two-spotted spider mite-infested leaves of Savalan (as compared with the other tested cultivars). The female predators reared on the two-spotted spider mite-infested leaves of Savalan cultivar were of higher body mass and greater body sizes among the six tested cultivars of the potato crop. The prey consumption per *O. minutus* nymphs on Savalan was significantly higher than that occurring on Kondor and Diamant cultivars. Therefore, it can be concluded that cultivation of Savalan potato cultivar integrated with *O. minutus* as a biological control agent could be practically useful in the integrated management of *T. urticae* in the potato fields of Ardabil.

Keywords: *Orius minutus*, Population density, Predator efficacy, Potato, *Tetranychus urticae*.

A Review of Iranian Rhagidiidae (Acari: Prostigmata) and New Reports of one Genus and Three Subgenera from Iran

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ABSTRACT

Predaceous mites of the family Rhagidiidae are predators that include some representatives of the soil mesoedaphon in various habitats. During an investigation on edaphic mite fauna in green spaces and parks in Tehran City (Tehran province, in 2001-2002), and as well in oak forests of Koohmare-Sorkhi region (Fars Province, during 2010-2011), the genus *Poecilophysis* Cambridge, 1876 along with three species belonging to three subgenera were collected and identified, all of which are new records in Iranian mite fauna. A key to the reported genera of the family from Iran is presented, with a list of the collected species as follows: *Poecilophysis (Dentocheles) pratensis*, *Poecilophysis (Procerocheles) faeroensis*, *Poecilophysis (Soprocheles) arena*.

Keywords: Koohmare-Sorkhi, Mite, *Poecilophysis*, Tehran, Trombidiformes.

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Genetic Diversity of *Chilo suppressalis* (Lepidoptera: Pyralidae) Populations Based on RAPD Marker in Guilan Province, Iran

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ABSTRACT

To investigate the genetic diversity of *Chilo suppressalis* populations in Guilan province, a number of 37 of samples (4-6th larva stages) were collected from 17 different regions of the province. The collected samples were parted into three population groups coming from west, center and east parts of Guilan. Extracted DNAs were polymerized through 12 RAPD markers. RAPD-PCR products were electrophoresed on a 1.5% agarose gel and photographed through GelDoc. Following bands scoring, analysis of data revealed that the 12 primers produced a total of 112 polymorphic bands. Results indicated that *C. suppressalis* population differs from the other two populations. Center and east Guilan populations demonstrated more similarities to each other. This could be due to an occurrence of gene-flow between the two populations causing the similarities. The population coming from the center of Guilan demonstrated a highest level of intrapopulation genetic variation due to a wider activity area and as well due to a higher number of the studied samples. These results finally indicated that population's active in the province lack homogeneity and are comprised of two different biotypes. In total, the results could be considered as an explanation for morphological and biochemical differences found among the active biotypes within the studied areas.

Keywords: Biotype, Electrophoresis, Genetic variation, Marker, RAPD-PCR.

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Effect of Culture Substrates on Virulence of *Metarhizium anisopliae* Conidia and Blastospores against Sunn Pest, *Eurygaster integriceps*

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ABSTRACT

Virulence of blastospores and conidia of the fungus *Metarhizium anisopliae* were investigated on different instar nymphs and adults of Sunn pest, *Eurygaster integriceps*. Experiments were carried out through a factorial arrangement in a completely randomized design of three replications. The bioassays were performed through immersion method. Results revealed significant differences among virulence of blastospores and of conidia produced in different media. The highest vs the lowest total mortality percentages of the second instar nymphs were recorded as 100 and 41.6% on rice bran vs wheat bran+ rice bran media respectively in blastospore treatments. As for conidia, the highest total mortality percentage of second instar nymphs was 100% on wheat bran, Behnoush waste barley and rice flour media whilst the lowest total mortality percentage recorded as 86.1% on maize medium. Minimum LT₅₀ was recorded (2.3 days) on wheat bran + yeast extract medium in the second instar nymphs whilst the highest LT₅₀ recorded (10.1 days) on wheat bran+ rice bran extract medium for the fourth instar nymphs in blastospore treatments. Minimum LT₅₀ was recorded (4.7 days) on the rice bran medium and at second instar nymphs while the highest recorded (13.1 days) for the fourth instar nymphs by conidia harvested from non-broken rice medium.

Keywords: Culture substrate, *Metarhizium anisopliae*, Sunn pest, Virulence.

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Efficacy of *Cryptolaemus montrouzieri* in Biological Control of *Planococcus citri* on *Solenostemon scutellarioides* Under Greenhouse Conditions

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ABSTRACT

Citrus mealy bug, *Planococcus citri* (Risso) is one of the most common and well known pest insects of ornamentals. Coleus, *Solenostemon scutellarioides* (L.) Codd is a suitable host of the mealybugs. Mealybug destroyer, *Cryptolaemus montrouzieri* Mulsant (Coleoptera: Coccinellidae) is a polyphagous predatory coccinellid, employed in biological control programs against citrus mealy bug. The present work was carried out to study the efficacy of this predator (biological control agent of citrus mealy bug) on coleus (red variety) and to determine the most suitable releasing rate of the predatory coccinellid under greenhouse conditions. The same-aged coleus plants were infected by 2nd and 3rd instars of the mealy bug nymphs. Following the pest establishment, mealy bug destroyers were released on plants at the rates 1, 2, 3 and 4 coccinellid/ plant as four treatments along with a non-treated plant used as check. Any of the treatments was replicated 4 times. Efficacy in each treatment was determined through Handerson-Tilton method within the period of one to 15 days after releasing the predator. ANOVA revealed statistically significant differences within treatments. The treatments bearing 2, 3, and 4 coccinellids / plant exerted the highest effect in biological control of the mealy bug and were statistically placed in one group. On the 15th day following the release of the predator, there was no statistically significant difference observed between the treatments of 3, vs 4 coccinellid/ plant. Based on the achieved results, releasing 2 coccinellid/ coleus plant in greenhouse conditions can provide more than 92% efficacy in biological control of the mealy bugs.

Keywords: Biological control, *Cryptolaemus montrouzieri*, Efficacy, Greenhouse, *Planococcus citri*.

Efficacy of Native Strains of *Trichoderma harzianum* in Biocontrol of Pistachio Gummosis

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ABSTRACT

To identify *Trichoderma* isolates for potential biocontrol of crown and root rot in pistachio, 100 samples of soil taken from rhizosphere, fertilizer channels and from soil surface were collected from Kerman, Yazd, Khorasane Razavi and Semnan provinces during 2009-2011. Overall, 32 isolates of *Trichoderma harzianum* were obtained mostly from rhizosphere soil using either general or special environmental surroundings. The antagonistic potential of the isolates against *P. melonis* was screened using the dual culture technique. A total of 11 isolates were employed for further assessment of their capability to inhibit *P. melonis*, in various assays under *in vitro* and as well *in vivo* conditions. Overall, the results indicated that the incidence of interactions through different mechanisms reduced mycelial growth of *P. melonis* to different degrees, ranging from 38.1 to 63.6%, 25.4 to 58.7%, 50 to 89.6% and 44.7 to 71.77% in the simultaneous vs non-simultaneous dual cultures, and volatile vs non-volatile compounds, respectively. In greenhouse experiments, and in mixed inoculations with *Trichoderma harzianum* strains and *P. melonis* it was observed that, root length and plant height increased respectively from 1.5 to 2.7 and from 1.4 to 2.1 times of inoculation with pathogen alone, as well as 1 to 1.9 of root length and 1 to 1.6 times the plant height as compared with non-inoculated control plants. Incidence of *T. harzianum* isolates before, simultaneous with, and following pathogen inoculations (in pots) significantly influenced the mortality of seedlings with the respective ranges of 0 to 31%, 0 to 56%, and 12.5 to 75%. This is the first report on the introduction of *T. harzianum* isolates to pistachio orchards, along with their interactions with gummosis (crown and root rot) causal agents.

Keywords: Biological control, *Phytophthora*, Root and crown rot.

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Survey of *Bacillus* SPP. Isolates for Biological Control of White Rot of Garlic Caused by *Sclerotium cepivorum* Under *in Vitro* and Greenhouse Conditions

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ABSTRACT

Sclerotium cepivorum incited white rot is one of the destructive diseases of garlic in Hamedan Province. A total number of 175 *Bacillus* strains were isolated from soil and from garlic rhizospheres. The antagonism of the bacterial isolates against *Sclerotium cepivorum* was evaluated using dual culture method. Ten high level activity isolates which produced inhibition zones were selected for further study. Physiological, biochemical, and morphological characteristics of the isolates revealed that they belonged to the species of *Bacillus*. Antifungal activity of the liquid and volatile metabolites produced by the bacterial isolates on pathogen and as well, their ability to produce the enzyme protease and hydrogen cyanide were studied. All the isolates produced volatile as well as liquid metabolites, reducing disease significance through their different effects. Isolates B9, B21 and B12 produced protease, but none produced hydrogen cyanide. The antagonistic activity of bacterial isolates was evaluated against the pathogen, employing soil and seed treatment methods. Greenhouse trial results indicated that all the isolates were able to control the severity of the disease, but isolates B12, B21, B3, B20, and B9 showed their effects in either one of the experimental methods more than 73% Isolates B3 and B21 showed the most effects on reduction of the disease (73-83.3%). All the isolates significantly ($P \leq 0.01$) promoted growth factors in garlic plant.

Keywords: Antagonist bacteria, *Bacillus*, White rot of garlic.

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First Report of *Stictospora* sp. (Apicomplexa: Eugregarinida: Actinocephalidae) and its Pathogenicity on White Grub, *Polyphylla adspersa*

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ABSTRACT

Eugregarinidae, an endoparasite group, the members of which inhabit the intestine of a large number of invertebrates, belong to Apicomplexa taxon. Individuals of this order are known by their large trophozoites, morphological and behavioral dissimilarity between the two stages of trophozoite vs sporozoite, chronic effect on the host and having the nucleus being situated in its deutomerite part. To study this entomopathogenic pathogen and its occurrence in natural populations of white grub, *Polyphylla adspersa* (Col., Melolonthidae), sampling was conducted to collect from both the second and third larval stages of the white grub (during September 2011) from urban parks and landscapes of Mashhad (Khorasane Razavi Province, Iran). The digestive tracts of 105 larvae were dissected to detect any possible infection of the entomopathogenic protists. During this process, parasite specimens from suborder Septatorina were observed in the foregut as well as midgut portions of the second instar larvae. Different developmental stages of the eugregarine (except oocyst and gametocyst stages) were observed. This apicomplexan was characterized as *Stictospora* sp. Morphometric parameters of adult trophozoite and gamont (including Primitive and Satellite) were assessed. The data revealed that a trophozoite's length is 2176 μm (1100-2800 \pm 92.06) including the three parts of epimerite, protomerite and deutomerite. The gamonts are differentiated from each other as according to the nucleus location in their deutomeritic parts. Gamonts are normally of the couple process, syzygy type of zygosis. Exposure of the infected white grub to stress conditions caused the death of the host by destroying the front parts of the digestive system. Impact of the protist was exacerbated when accompanied by the activity of some species of an Oxyurida nematode. The nematode was found out as belonging to *Cephalobellus* genus from Thelastomatidae family, a new genus of nematode reported from Iran. Sporadic and local impact of the protist in fluctuations of pest population density via an increase in larval susceptibility as well as the incidence of chronic infection could be significant. The current study is the first global report on the natural infection of white grub, *P. adspersa* by *Stictospora*. In the meantime, it presents the first record of the genus *Stictospora* from Iran.

Keywords: Chronic infection, Insect pathology, Oxyurida, Septatorina, White grub.

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Study on the Genetic Diversity of *Ascochyta rabiei* Isolates, Cause of Chickpea Blight Disease in Lorestan Province Using SSR Marker

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ABSTRACT

Ascochyta blight caused by *Ascochyta rabiei* is one of the most destructive diseases affecting chickpea (*Cicer arietinum*). To study the genetic diversity of the fungus, fifty three isolates were randomly collected from chickpea fields in eight different regions of Lorestan Province namely Azna, Aleshtar, Broujerd, Poldokhtar, Chegeni, Khooramabad, Koohdasht, Noorabad. The isolates were cultured and purified on specific chickpea seed meal dextrose agar medium. Genetic diversity among the population was assayed, employing SSR marker and using five specific primer pairs. Similarity of the isolates was determined using Dice's coefficient and UPGMA clustering method. Cluster analysis of data revealed that isolates with genetic similarity distance equal to 3% were placed in 9 distinct genetic groups. PCoA analysis of data was done employing Jaccard similarity matrix in NTSYS software. According to the acquired data, from among 53 components, 15 components stood within an Eigenvalue greater than 1 with 90.49 % of variation being justified. Analysis of molecular variance (AMOVA) revealed the highest genetic variation (96%) within populations while distributed among populations by 4%. The results finally indicated that there is considerable genetic diversity among and between the isolates collected from different regions of the province.

Keywords: Ascochyta blight, Dice's coefficient SSR marker, Genetic diversity.

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Population Dynamics and Spatial Distribution of Important Thysanoptera Species on Wheat

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ABSTRACT

Population dynamics and spatial distribution of two harmful species of Thysanoptera prevalent on cereal crops (*Thrips tabaci* Lindman, 1888 and *Hoplothrips tritici* Kurdjomove, 1912), were investigated during 2009-2011. Weekly sampling was carried out in a one hectare of wheat field in Ramin University of Khuzestan, South-West of Ahvaz. Spatial distribution of immature as well as adults of either species was investigated through Taylor's power law and Iwao's patchiness regression methods. The results revealed that the population peak for either species occurs in late March and on the first to middle of April respectively for adults and for larvae. Results of correlation between population dynamics (larval and adult stages) and the factors temperature and precipitation revealed that there is positive vs negative correlations between population fluctuation and the factors of temperature vs humidity. An investigation of the spatial distribution through Taylor's power law and Iwao's patchiness regression method indicated that larval stage and total stages in both species are clumped. Based upon R^2 and F of regression analysis, Iwao's patchiness provided a more adequate description of spatial distribution than Taylor's power law for either of the species. Because the seasonal peak in these two species' density corresponded with the period of peak bloom, thus, in order to study the population dynamics, the earing stage is the most suitable for sampling the thrips on wheat.

Keywords: *Hoplothrips tritici*, Population dynamics, Spatial distribution, *Thrips tabaci*.

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Response of Eight Tomato Cultivars to Root-knot Nematode, *Meloidogyne javanica*, under Glasshouse Conditions

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ABSTRACT

The present study was conducted to evaluate the response to root-knot nematode, *Meloidogyne javanica* of seven in glasshouse grown tomato cultivars, two from UK (GH1 & GH12), two from Thailand (Ajeet & Karina), and three from India (Manisha, Tolstoi & Cluster5) plus one local field grown variety from Kohgiluyeh va Boyer-Ahmad Province, in the glasshouse conditions. The factorial experiment was performed using two experimental factors of tomato cultivar and nematode inoculation, in a randomized complete block design of 5 replications. Each and every pot was filled with pasturised soil, with the tomato seedlings at their six-leaf stage, inoculated with 2000 second stage larvae of *M. javanica*. Plant growth and nematode reproductive factors were assessed 8 weeks after treatment. The tested tomato cultivars exhibited different levels of susceptibility to the nematode. The cultivars GH12, Ajeet, Manisha and Karina proved to be significantly different from the other ones. Their gall index was recorded 2, so they can be considered as relatively resistant cultivars. Other cultivars, gall index of 4 proved them susceptible to *M. javanica*. Throughout the study, the local variety was shown to be the most susceptible reducing plant growth and supporting of the nematode population density.

Keywords: Cultivars' comparison, *Lycopersicon esculentum*, *Meloidogyne javanica*, Tomato, Resistance, Root-knot nematode.

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Biological Control of Alternaria Rot of Tomato by Two Bacterial Strains, *Pseudomonas fluorescens* UTPf68, and *Bacillus subtilis* UTB96

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ABSTRACT

Poor packaging and improper management causes fruits get bruised and squeezed, allowing for different types of rots to develop when the necessary favorable growth conditions available. Tomato fruit is beset with problems of both field and storage rot. Throughout the present study, two biocontrol bacteria *Pseudomonas fluorescens* UTPf68, and *Bacillus subtilis* UTB96 the large scale production of which had been successfully carried out in industrial bioreactor were tested against some isolated tomato post harvest pathogens, in either *in vitro* or *in vivo* conditions. AlphaDual culture results indicated that *B. subtilis* UTB96 inhibited mycelial growth of *Alternaria alternata* and of *Penicillium* spp. for about 68.7 and 81.7 percent respectively. Also, *P. fluorescens* UTPf68 was shown to prevent the mycelial growth of *A. alternata* and of *Penicillium* spp. by about 62.2 and 24.3 percent respectively. A substantial potential of the bacterial strains, in preventing the growth of fungus *A. alternata* on tomato fruit was finally observed. The bacterium *B. subtilis* UTB96 reduced rot development of tomato fruits caused by *A. alternate* for about 92.5 percent. Meanwhile, bacterium *P. fluorescens* UTPf68 inhibited the mycelial growth of the postharvest pathogen *A. alternata* on tomato fruits by about 76.5 percent. The results of this study plus future complementary researches can help the development and application of large scale biological control intended to reduce the post harvest incidence of diseases.

Keywords: *Alternaria alternata*, *Bacillus subtilis*, UTB96, post-harvest diseases, *Pseudomonas fluorescens*, UTPf68, Tomato.

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Study on Partial Resistance to Sheath Blight Disease (*Rhizoctonia solani* AG1- IA) in Iranian and Selected Exotic Cultivars of Rice

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ABSTRACT

Rice sheath blight disease caused by *Rhizoctonia solani* AG1- IA is the second economically important disease of the crop in most rice- growing regions of the world, including Northern of Iran. The disease is mainly controlled through application of fungicides. The present study was performed to identify the candidate cultivar (cultivars) as source of resistance to the pathogen in rice field conditions in Northern Iran. Thirty seven vs twenty three rice cultivars respectively from Iranian Local (IL) and IranianImproved (II) cultivars along with ten Foreign Resistant (FR) cultivars were field grownat the Rice Research Institute of Iran. They were inoculated with the mycelial mass of a virulent isolate (G309) of pathogen, 45 days after being transplanted. To supply favorable humidity for disease development, the plants were kept wet until the evaluation time through 2-5 times of daily water spraying, while applying a overhead water sprayer system available on the field. Assessment of cultivars, reaction was done by recording the Sheath Blight Severity as appeared on the sheath (SSS), number of Lesions on the Sheath (LS), Relative Lesion Height (RLH), percentage of Infected Tiller (IT), number of Dead and Green Leaves(DL and GL), Number of tillers (Nt), Tiller Angle (TA), Stem Width (SW), and Plant Height (PH). Results indicated that, the group of FR cultivars significantly differed from groups (IL) and (II) cultivars by exhibiting less SSS, LS, DL vs more GL. Cluster analysis of the cultivars as based on RLH, SSS and DL, using UPGMA method revealed 4 groups. One of the grups comprised of: Jasmine 85, Teqing, Pecos and Tetep was observed as resistant, whereas, another one containing Swarna (Foreign susceptible), Moosatarom, Hassansaraei, Jamshidjo, Khazar, Shiroodi, D4 (IL and II), and Fujiminori was recorded as susceptible. Analysis of the relationship between plant traits and disease response indicated that RLH and SSS were not significantly correlated with the assessed morphological characteristics as regarded FR cultivars, whereas a positive significant correlation was observed between SSS and TA ($r = 0.20$, $P. value = 0.033$), and a negative one between RLH and PH ($r = -0.29$, $P. value = 0.002$) as detected on local cultivars.

Keywords: Partial resistance, *Rhizoctonia solani*, Rice cultivars, Sheath blight disease.

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Evaluation of Mechanisms of Barley Genotypes Tolerance and Antixenosis *Schizaphis graminum* (Rondani)

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ABSTRACT

Schizaphis graminum (Rondani) (Hem.: Aphididae) is one of the seriously injurious pests of cereals particularly of barley. The population of the pest has been on the increase in recent years. Besides chemical control, another practically suitable method of controlling the pest is the use of resistant barley genotypes. In this research, 47 advanced lines along with 13 cultivars were screened in their seedling stages in greenhouse conditions ($25\pm 2^{\circ}\text{C}$, $55\pm 10\%$ relative humidity and 16:8 photophase) while testing basis two mechanisms of antixenosis and tolerance on them. Screening was made on the basis of mean number of aphids (14 days after infection with the aphid). Raihan, Nosrat cultivars as well as line 20 (Mall-4-3094-2//Alpha/Cum/3/Victoria/...ICB01-1368-0AP), carrying the least, while line 13 (Legia/CWB117-5-9-5), line 44 (SIs/Bda/Sararood-1) and Zarjo cultivar attracting the most mean number of aphids, were selected for antixenosis and for tolerance tests. Antixenosis experiment was carried out as based upon the number of attracted aphids to different cultivars within 24, 48, and 72 hours following insect release. Results indicated that Zarjo and Raihan cultivars bore the weakest vs the strongest antixenosis, respectively, as observed within all the three experimental times. Tolerance experiment was judged by the effect of aphid feeding on host plant height wise. Raihan cultivar had the most increase in its secondary height (compared with control) and the least percentage of decrease in its main height (%2.09). Conversely, Zarjo cultivar exhibited the least increase in its secondary height (compared with control) and the greatest percentage of decrease in its main height (%65.96), suggesting a least level of tolerance.

Keywords: Antixenosis, Barley, *Schizaphis graminum*, Screening, Tolerance.

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Biological Characteristics and Life Table Parameters of the Olive Leaf Moth, *Palpita unionalis* (Lep.: Pyralidae) Feeding on Three Olive Varieties in Iran

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ABSTRACT

Olive leaf moth, *Palpita unionalis* (Hübner) is an injurious pest of nurseries, of young olive trees, and also of the suckers of old trees. It feeds on some other such host plants as Ash, Jasmine and Privet. Knowledge of the biology and life table parameters of the pest species is needed in any pest management program. In this work, life history traits and life table parameters as well as the population projection of *P. unionalis* were studied at $25 \pm 1^\circ\text{C}$, $65 \pm 5\%$ R.H. and photoperiodism of 16:8 (L: D) on three olive cultivars of: Zard, Rowghani and Kronaiki. The age-stage, two-sex life table is made use of incorporate both sexes and the variation in developmental rate among individuals and as well to obtain accurate population parameters. The developmental time of immature stages (egg to adult emergence) on Kronaiki, Rowghani and Zard recorded were 35.05, 33.78 and 36.08 days, respectively. The longevity of the female vs male adults in the three varieties were (9.33 and 7.00), (10.64 and 10.60) and (10.21 and 8.10) days, respectively. There was no significant difference observed among the life table parameters of the three tested varieties. The intrinsic rates of population increase on Kronaiki, Rowghani and Zard were 0.044, 0.049 and 0.047 d^{-1} , respectively. The highest net reproductivity was found to be 8.61 offsprings per individual on Rowghani. Mean generation times (T) on the three varieties were 43.56, 42.12 and 42.04, respectively. Overall, Kronaiki was evaluated as the most undesirable as regards the pest. Therefore, considering other advantages of the variety and also considering the other pest species, this variety could be recommended as the most suitable one to largely reduce the pest problem.

Keywords: Age-stage, Biological traits, Olive, Olive leaf moth, *Palpita unionalis*, Two-sex life table.

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The Effect of Irrigation Interval on Reproduction Traits of Root-knot Nematode (*Meloidogyne javanica*) in Two Navy Bean (*Phaseolus vulgaris*) Varieties

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ABSTRACT

Root-knot nematode which causes extensive damage to legumes and cereals has been reported in many countries. The nematode has been observed on legumes, roots in many regions of the world, causing swollen root and yield reduction. In order to evaluate the effect of irrigation interval on reproductive traits of root-knot nematode, and the damage inflicted upon navy bean, a study was conducted in 2011 in the research greenhouses of Shiraz Islamic Azad University. The factorial experiment was arranged in an RCB design of three replications. Three factors, including- variety at two levels; irrigation interval at three levels, and infestation at two levels were considered. Nematode inoculation was conducted at the seedling stage of navy bean by a number of 2000 eggs plus second stage juveniles per kg of soil in each pot. Plant growth and nematode reproduction trends were started to be assessed two months following inoculation. On the basis of the recorded results the effect of irrigation interval on the whole traits, related to nematode, was significant at a 1% level of probability. The highest and the lowest number of galls per root, egg mass per root, nematode final population as well as reproduction traits were recorded for the 48 and 96 hour irrigation intervals respectively. The two irrigation treatments significantly differed at 5% level as regards the four tested traits. The results also revealed that varieties at different irrigation intervals responded differently to nematode damage. As much as the soil moisture content was less, the nematode was more disabled and plants grew with more vigor. So, maybe one can retard the growth of nematodes by management of irrigation interval especially when the probability of damage of the nematode is high, although the economic performance of the crop should also be put into consideration.

Keywords: Irrigation interval, Navy bean, Reproduction factor, Root-knot nematode.

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