

Inhibitory Effects of Common Lambsquarters (*Chenopodium album*) Seeds on Seed Germination of Maize (*Zea mays*) and Shattercane (*Sorghum bicolor*)

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Abstract

Most allelopathic studies have demonstrated the importance of live and dead plant tissues as source of allelochemicals. Seeds of several species also have inhibitory effects on germination of the same or other species. In order to determine the allelopathic effects of common lambsquarters (*Chenopodium album*) seeds, an experiment was conducted under controlled conditions in Birjand University, IRAN. The laboratory experiments were carried out in a completely randomized block design with 6 replications. Four treatments of each crop species were consisted of 15 seeds of shattercane (*Sorghum bicolor*) and/or 10 seeds of maize (*Zea mays*) with 0, 200, 400 and 600 seeds of common lambsquarters that were equally distributed around seeds of both crop species. Results indicated as the number of weed seeds increased, the crop germination percentage was decreased significantly. There were significant effects of neighboring weed seeds on coleoptile and radicle length, number of secondary and adventitious roots and length of secondary and adventitious roots of crop species.

Keywords: Root growth, Coleoptiles growth, Seed exudates, Allelopathy

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Some Species of *Helicotylenchus* Steiner, 1945 Found in Rapeseed Fields of North Khorasan Province

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Abstract

In order to identify the plant parasitic nematodes of rapeseed fields in North Khorasan Province, during years 2007-2008, 50 soil and root samples were collected. Nematodes were extracted by centrifugal flotation technique and transferred to glycerin according to the modified De Grisse method (1969). The permanent slides were prepared from the extracted nematodes. The nematodes were identified by light microscopy based on morphological and morphometrical characters. In this study, eight species of *Helicotylenchus* were identified as following: *Helicotylenchus digonicus*, *H. vulgaris*, *H. exallus*, *H. pseudorobustus*, *H. californicus*, *H. canadensis*, *H. minzi* and *H. crassatus*. Three species *H. californicus*, *H. canadensis* and *H. crassatus* were reported for the first time from Iran. *H. californicus* is recognizable from related species by the hemispherical lip region, functional spermatheca in female and shape terminus projection of tail, from *H. canadensis* by the truncate lip region with 4-5 annulations, long stylet and tail terminus hemispherical and from *H. crassatus* by the truncate lip region and tail shape.

Keywords: Rapeseed, Plant Parasitic Nematodes, *Helicotylenchus*, North Khorasan Province

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Identification of *pythium* spp. and Their Pathogenicity on Cucurbits in Khorasan-Razavi Province

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Abstract

The *pythium* spp. are known as the principle agents of seedling blight, damping-off and root rot of cucurbits. This study was performed for determination of *Pythium* species involved in this diseases as well study their pathogenicity on different cucurbits. The numerous samples were taken at cultivation seasons 2006- 2007 from the fields of cucumber, tomato, egg plant, muskmelon, cucurbit, melon, and watermelon, situated in Mashhad, Chenaran, Ghochan, Fariman, Torbtejam, Gonabad, Kashmar, Khvaf, Neishboor, Sabzevar, Torbatehedarieh, Kalat, Dargaz, Sarakhs, and Taibad (North East of Iran). sixty pythium isolates were obtained from the diseased samples in total. They were identified based on morphological and micrometric characteristics. The results showed that 46.44% are belonging to the *P. ultimum* var. *ultimum*, 16.66% to the *P. aphanidermatum*, 13.33% to the *P. amasculinum*, 10% to the *Pythium* Group HS, 16.66% to *P. oliganderum*, 3.33% to the *P. paroecondrum*, and 3.33% to the *P. echinulatum* . The *P. amasculinu* , *P. echinulatum* and *P. paroecondrum* are the first report from Iran . The *Pythium* Group HS and *P. oliganderum* are also the first report from cucurbits in Iran. The pathogenesis test of isolates showed that *P. ultimum* var *ultimum* , *Pythium* Group HS *P. paroecondrum* , *P. aphanidermatum* and *P. echinulatum* are pathogenic on cucumber, tomato, egg plant, muskmelon, cucurbit, melon, and watermelon, while *P. amasculinum* was not Pathogenic on melon and cucurbit.

Keywords: *Pythium*, cucurbits, Root and foot rot, Seedling blight, Damping-off, Pathogenicity

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Detection of Potato Virus S (PVS) by Serological and RT-PCR Methods in Khorasan Razavi and Hamedan Provinces

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Abstract

Potato virus S is a member of the genus *Carlavirus* in the family of *Flexiviridae*, with curved filamentous particles 650×12 nm and positive single stranded RNA genome. This virus is one of the most common viruses that infected all of potato varieties in the world. Susceptible host species belong mainly to the families Solanaceae, Chenopodiaceae and Amaranthaceae. *Potato virus S* transmits by mechanical inoculation and *Myzus persicae* as well in a non-persistent manner. Samples of 555 tubers showing symptoms of mosaic, necrotic spots, vein partial deepening, rugosity, undulation of the margin, wilting and dwarfing from 50 fields in Khorasan Razavi and Hamedan provinces were collected. After tubers passed dormancy period at 4°C and germinated, PVS polyclonal and special antiserum were used in DAS-ELISA to identify infected potato tubers. Sap of infected samples inoculated on indicator plants such as *Chenopodium quinoa* and *C. amaranticolor* (chlorotic spots on the leaf), *Nicotiana debneyi* (severe mosaic), *N. tabacum var. xanthi* (immune) and *Lycopersicon esculentum* (mosaic). Results of ELISA test indicated that 69 samples out of 555 samples were infected. To confirm the results of ELISA test, RT-PCR and specific primer for amplification of coat protein gene were used. Specific primers amplified 1118 bp fragment related to coat protein of the virus.

Keywords: DAS-ELISA, PVS, RT-PCR

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Report New one Genus and Two Species in Suborder Aphelenchina for Fauna Nematodes of Iran

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Abstract

In order to identify the plant parasitic nematodes of cucumber field and greenhouses in Jiroft and Kahnoj regions, during 2007 and 2008, 45 soil and root samples were collected. In this survey, 13 genus and 16 species were identified. Genus *Ektaphelenchoides* and one species of it, *E. compsi* and *Aphelenchus isomerus* are reported for the first time in Iran. The first species was found in the soil samples of Hoseinabad anbarabad, Malekabad Kalarod and Hoseinabad bansaraji in Jiroft region and the second species was found in the soil samples bagherabad of Jiroft region. Genus *Ektaphelenchoides* belong to suborder Aphelenchina, family Aphelenchoididae and subfamily Ektaphelenchinae. *E. compsi* was separated from the other species of this genus by having a flat head and continuous, longer post uterine sac and shorter tail terminus mucron. In species *Aphelenchus isomerus* vagina is symmetric and isomorphic.

Keywords: Cucumber, Aphelenchina, *Ektaphelenchoides compsi*, *Aphelenchus isomerus*

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Effects of Three Biological Products on Rice Sheath Blight Disease in the Field

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Abstract

Sheath blight is an important rice disease in the Mazandaran Province of Iran. Biological control of this disease as alternative of chemical control with propiconazol (Tilt) fungicide, examined with 3 biological products, Trichodermin AB, Trichodermin B and Subtilin produced in Iran. At first in the laboratory, fungi and bacterium isolated and purified from these products, and their ability for antibiosis and hyper-parasitism, of pathogen evaluated. Then effect of these products comprised with Tilt in the field on Fajr cultivar in completely random block design with 4 replicates. Disease severity and damage, plant infection height, one thousand seeds weight, mean of tillering, yield and height of plant estimated. The results showed, applying Trichodermin AB can significantly decrease disease severity rate and damage, and prevent reduce of 1000 grains weight. At the level of healthy control and more better than fungicide propiconazol. Therefore it can introduce to farmers as suitable alternative of chemical control. Efficacy of this biological product for control rice sheath blight disease report for the first time from Iran.

Keywords: Rice sheath blight, Trichodermin AB, Trichodermin B, Subtilin, Propiconazol

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Evaluation of Organic Manure and Atrazine Application Rate on Its Degradation

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Abstract

Atrazine is the most important triazine herbicides with moderately persistence in soil. In order to study the effects of manure and its application rate on atrazine degradation, an experiment was conducted as split plot in completely randomized design with 3 replications. Experimental factors included organic manure at 2 levels (0 and 50 ton per hectare) as main plot and atrazine application rate at 2 level (2 and 4 kg a.i per hectare a.i.) as sub plot. Results showed that atrazine persistence increased as increasing its application rate and organic manure added in soil. Highest half-life (12.92 days) and lowest degradation rate (0.0536 mg/kg soil day⁻¹) was observed in 50 kg organic manure and 4 kg atrazine per hectare and lowest half-life (3.64 days) and highest degradation rate (0.19 mg/kg soil day⁻¹) was observed in 0 kg organic manure and 2 kg atrazine per hectare. Based on results of this experiment, increasing of organic manure in soil can decrease atrazine leaching and increase its degradation. It seems increasing of soil microbial community and activity, will affect atrazine degradation rate.

Keywords: Herbicide, Soil texture, Microbial activity, Persistence, Half-life

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A Study on Some Biological Aspects of *Chilo suppressalis* Walker (Lepidoptera: Pyralidae) in Rice Fields of Mazandaran

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Abstract

Some biological aspects of *Chilo suppressalis* Walker (Lepidoptera: Pyralidae) was studied in paddy fields of Mazandaran during 2007-2008. The studied characteristics were the number of larval instars and developmental time of each stage in two generations. The results indicated that the number of larval instars were different in each generation, including six instars in the first generation and five instars in the second one. Head capsule width of different instars were significantly different and there was not overlap between them in despite of vast range. The mean developmental time of each larval instars were longer in the first generation than the second one. The total mean developmental period in the first generation was determined 1.25 times of the second generation. Therefore the larvae of first generation of *C. suppressalis* molt once more than the larvae of second generation, and also their developmental time is longer than the second generation larvae.

Keywords: Biology, Larval instar, Generation, *Chilo suppressalis*, Mazandaran

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Effect of Tillage Number and Metribuzin Herbicide Dosage on Potato Weed Structure

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Abstract

In order to evaluate the effect of tillage number and metribuzin herbicide doses on weeds structure of potato, an experiment was conducted as the factorial in randomized complete block design with three replications in 2009 in the Sarab region of East Azarbaijan Province. The first factor was tillage number with a single moldboard plowing at autumn and double plowing (fall and spring moldboard plowing) and the second factor was different doses of metribuzin herbicide (Sencor) at three levels, 0 (control), 0.5 and 1 kg ai ha⁻¹. The results showed that double plowing compared with single autumn tillage reduced weed density by 65.3% at potato emergence stage. Metribuzin application compared with control decreased weeds density 40 to 58 percent and their dry weight 38 to 60 percent. Highest tuber yield (36/29 t ha⁻¹) was achieved in single autumn tillage treatment that was 14/66 percent over the potato tubers yield in the double plow.

Keywords: Integrated Weed management, Metribuzin, Potato, Tillage number, Weed structure

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Effects of Thiamethoxam on feeding and tunneling activities of the termite *Microcerotermes diversus* Silvestri (Isoptera: Termitidae) under laboratory conditions

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Abstract

Treating soil with insecticides is thought to be an effective method for termite control. Speed of action and repellency of insecticides are important factors for discussing their barrier effects as soil-treatment termiticide. *Microcerotermes diversus* (Silvestri) is the most economically destructive termite in structures in Ahwaz region, because the species feed on anything with cellulose. *M. diversus* live in subterranean nests and access to buildings and plants through subterranean galleries. The chemical barrier effect of thiamethoxam against *M. diversus* was evaluated under the laboratory using glass tube and plastic container methods. The concentrations used ranged from 5 to 5000 ppm. Soil treated with >50 ppm of thiamthoxam had a barrier effect and could stop the penetration of termite within 7days. Thiamethoxam did not act as a repellent, as indicated by a gradual increase in mortality at >50 ppm with slight penetration, tunneling area and feeding activity into the treated soil during the 7-day trial. The results suggest that thiamethoxam is an effective termiticide, a suitable barrier for soil treatment, that also acts as a non-repellent, inhibitive entry of termites into treated soil.

Keywords: *Microcerotermes diversus*, Thiamethoxam, Repellent, Mortality, Tunneling and Feeding Activities

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Effect of Environmental Factors on Germination and Emergence of Eastern Dodder (*Cuscuta monogyna*)

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Abstract

In order to study the effect of environmental factors (light, temperature, salinity and drought stress, acidity and burial depth) on germination and emergence of eastern dodder (*Cuscuta monogyna* Vahl), experiments were conducted at the Research Laboratory of Faculty of Agriculture, Birjand University in 2009. Results showed that seeds of this parasite weed had identical germination under light/dark and continuous dark conditions, indicating this weed species is non-photoblastic. Seeds of this weed species showed average germinability greater than 84% over a wide range of temperatures (10/5, 20/10, 25/15, 30/20 and 35/25 C) at both light/dark and continuous dark regimes and the maximum germinability (98.3%) was observed at 25/15°C. Eastern dodder could retain its germinability at high salinity levels and even at salinity level of 320 mM NaCl 66.67% of seeds germinated, although its germination was ceased at 640 mM NaCl. Seeds germinated greater than 80% until the drought level of -0.8 MPa, while further increasing of drought stress caused a remarkable reduction of seed germination. This weed seeds showed averagely greater than 90% germination at pH range of 4-10 and seed germination was not notably affected by pH. Seed burial depth had a great impact on eastern dodder seedling emergence, so that no seedling emerged from seeds buried deeper than 3cm and maximum emergence (100%) occurred where seeds placed on the soil surface covered with 2 layers of filter paper. The information of this study would be helpful for estimating the potential of this species to spread to new areas.

Keywords: Eastern dodder, Weed ecology, Parasite weeds, Burial depth

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Investigating Effect of Planting Dates on Density and Dry Weight of Weeds and Soybean Cultivars (*Glycine max* L.) Yield

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Abstract

Limited number of herbicides are used to control weeds in soybean, which has herbicides resistance in consequence, so cultural weed management can be used in order to evaluate the effect of planting dates of soybean cultivars on weed management. An experiment was conducted in randomized complete block design (RCBD) with four replications and with strip plot arrangement in Sari. Two planting dates (May 18th, June 7th and 27th) and five soybean cultivars (BP, GK, 032, 033 and Sahar) along with weed management: 1- Ethalfluralin (Sonalan) 3 l/ha PPL, 2- Ethalfluralin (Sonalan) 3 l.ha⁻² PPL + Metribuzin (Sencor) 700 g.ha⁻² PPL, 3- Ethalfluralin (Sonalan) 3 l.ha⁻² PPL + Metribuzin (Sencor) 700 g.ha⁻² PRE, 4- Bentazon (Bazagran) 3 l.ha⁻² PEM, 5- Trifluralin (Treflan) 3 l.ha⁻² PPL + Bentazon (Bazagran) 3 l.ha⁻² PEM, 6- Weedy check. Results showed that the density of grass and broadleaf weeds and total density of weeds decreased in mid and late planting, compare to early planting of soybean. Grass and broadleaf weeds weight were lower in mid and late planting date. Weed total weight were lower in early planting date to others. Soybean yield were higher in both early and mid planting. Ethalfluralin (Sonalan) 3 l.ha⁻² PPL + Metribuzin (Sencor) 700 g/ha PPL and Ethalfluralin (Sonalan) 3 l.ha⁻² PPL + Metribuzin (Sencor) 700 g.ha⁻² PRE reduced density and total weed weight, and these treatment gave the highest seed yield. 033 cultivar reduced grass and total weed density, and GK reduced grass weeds weight. BP, Sahar and GK produced the highest yield, but BP had the highest in presence of weeds.

Keywords: Herbicide, Planting date, Soybean varieties, Weed density

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Brief Report

Estimation of Epiphytic Population Size of *Pseudomonas syringae* pv. *syringae* on the Weeds of Apricot Orchards Infected to Bacterial Canker

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Abstract

The epiphytic phase of *Pseudomonas syringae* pv. *syringae* (*Pss*) has basic role in the outbreak and distribution. This research was carried out to estimate epiphytic population rate of *Pss* on some weeds of apricot orchards infected to bacterial canker. In October-November 2008, from the weeds including *Malva neglecta*, *Taraxacum officinale*, *Convolvulus arvensis*, *Chenopodium album*, *Sorghum halepense*, *Amaranthus retroflexus* and *Agropyron repense* were sampled. Then, various dilutions up-to 10^7 of suspension prepared from plant tissue were distributed on the semi-selective medium NAS and incubated at $25 \pm 1^\circ\text{C}$. After 48-72 hours, bacterial colonies were numerated and rate of bacterium per 1 gram of fresh tissue of the plants was calculated by using of the dilution multiples. Logarithm of the numbers was used for statistical analysis and mean comparison. The weeds were significantly different at probability level 1% for epiphytic population rate of *Pss*. *Sorghum halepense*, *Agropyron repense* and *Amaranthus retroflexus* had the highest epiphytic population rate with 6.785, 6.145 and 5.22 (Log bacterial cell per 1 gram plant fresh tissue) respectively and 2 weeds, *Malva neglecta* and *Convolvulus arvensis* had the lowest epiphytic population rate with 2.605 and 2.35 (Log bacterial cell per 1 gram plant fresh tissue) respectively. It is seem to the role of the growth pattern, structural and physiological attributes of the weeds in their epiphytic population rate become potential.

Keywords: Apricot, Bacterial canker, Epiphytic phase, *Pseudomonas syringae* pv. *syringae*

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Brief Report

First Record of *Alloxysta castanea* (Hartig, 1841) (Hym: Figitidae: Charipinae) Hyperparasitoid of *Hyalopterus pruni* (Hom: Aphididae) from Iran

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Abstract

Information on hyperparasitoid wasps of Figitidae family in Iran, in comparison to the numerous studies carried out in North America and Europe is very rare. So we have studied to determine the diversity of parasitoid wasps of aphids on stone fruit trees during 2009-2010 in Khorasan Razavi province-Iran. Several species of hyperparasitoid wasps were collected which among them, *Alloxysta castanea* (Hartig, 1841) is recorded for the first time from Iran.

Keywords: Hyperparasitoid, *Alloxysta castanea*, Iran

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