



Serological and Molecular Detection of *Tomato spotted wilt virus* (TSWV) in Khorasan Razavi Province

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Abstract

In order to investigate the presence of *Tomato spotted wilt virus* (TSWV) in tomato fields of Khorasan Razavi province (Mashhad , Neishabour , Torbat-e-Hydariieh , Kashmar , Ghochan , Fariman , Takht-e-Golgeh and Roshtkhar), totally 636 samples were collected from tomato fields in summer of 2008 and 2009 . The plant that showed symptoms of chlorotic , necrotic and ring spot were collected and transferred to the laboratory in cold condition , then tested by TAS-ELISA . Sap from infected plants inoculated to 3 cultivars of indicator plant e.g *Nicotiana rustica*, *N . clevelandii* and *N. tabacum var Samsun* . To confirm symptomology, inoculated indicator plants tested by TAS-ELISA. For molecular detection, RNA extracted by use of RNX TM(plus) kit . In RT-PCR , specific primer , amplified a fragment of 276 bp . Using RT-PCR and mechanical transmission tests , the presence of TSWV has been proven in tomato field of the province .In inoculating indicator plants only *Nicotiana tabacum var Samsun* (leaf deforming and mottling) showed specific virus symptoms .

Keywords : Mechanical transmission, RT-PCR, *Tomato spotted wilt virus*

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Evaluation of Relative Resistance of Eleven Maize Hybrids against *Ostrinia nubilalis* Hb. (Lepidoptera: Pyralidae) in Moghan Region

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Abstract

European corn borer, *Ostrinia nubilalis* Hb. is a polyphagous insect, recognizing world widely as the predominant pest of maize. In this research the relative resistance of eleven hybrids of maize was evaluated in a field in Agricultural and Natural Resources Research Center of Moghan. This experiment was conducted in three replicates in a complete randomized block design. For comparison of the tested hybrids some traits including vertical tunnel length, number of vertical tunnel, larvae number in stalk, hole number in stalk, percentage of stalk breakage, and yield were used. The results showed that there was no significant difference among hybrids for vertical tunnel length, number of vertical tunnel, larvae number in stalk, and hole number in stalk. But, percentage of stalk breakage and yield were significantly different among the tested hybrids. The hybrids BC666, SC700 and SC704 with highest percentage of stalk breakage and low yield were the most susceptible hybrids and the hybrids EXP1 and ZP684 because of lowest percentage of stalk breakage and high yield were the most resistant hybrids. Moreover, among the tested maize hybrids there were significant negative correlations between percentage of stalk breakage and yield. The result of this research could be useful in reducing pest damage in maize crop.

Keywords: Maize, Resistance, *Ostrinia nubilalis*, Hybrid

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Evaluation of Some Crops Tolerance to Granstar (Tribenuron methyl) Herbicide Soil Residual

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Abstract

Tribenuron methyl (granstar) is one of the most important sulfonylurea herbicides using in Iranian wheat field. their residue persistence in soil is one of the main environmental and agronomical problems. In order to study the sensitivity of seven crops to tribenuron methyl soil residual, a bioassay experiment was conducted at Ferdowsi University of Mashhad at 2009. Experimental type was completely randomized design in a factorial arrangement with three replications. Treatments included crops (pea, bean, lentil, corn, rape seed, sugar beet and tomato) and tribenuron methyl residual simulated concentration in soil (0, 0.00009, 0.0002, 0.0004, 0.009, 0.001 and 0.002 mg kg⁻¹ soil). For analysis of results plants emergence was determined after a week of planting and their survival percentage, shoot and root biomass production measured 30 days after their emergence. Plants response to tribenuron methyl residue was fitted with sigmoidal 3 and 4 parametric equations to the shoot biomass data as a function of the herbicide residue concentrations and was used to calculate the doses for 50% inhibition of shoot (ED₅₀). Results showed, crop emergence, shoot and root growth were affected significantly (P ≤ 0.01) by tribenuron methyl soil residue. But tribenuron methyl residue didn't effect (P ≤ 0.05) on crop survival. The highest (80.96%) and the lowest (26.83%) shoot dry matter lost were observed in rape seed and bean respectively. Root biomass production in all crops reduced as increasing tribenuron methyl soil residual concentration as like as shoot biomass. The highest (91.27%) and lowest (31.3%) root dry matter lost were observed in rape seed and bean respectively. Based on ED₅₀ parameter for shoot, bean (0.0078 mg kg⁻¹ soil) and sugar beet (0.00002 mg kg⁻¹ soil) appeared to be the most tolerant and susceptible crops to tribenuron methyl soil residue respectively. Other crops as their susceptibility to tribenuron methyl followed the order: tomato < bean < pea < corn < lentil < rape seed < sugar beet.

Keywords: Sulfonylurea herbicides, Bean, Corn, Lentil, Pea, Rape, Sugar beet, Tomato, Tribenuron methyl

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Identification of Plant Parasitic Nematodes in Rapeseed fields in North Khorasan Province

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Abstract

In order to identify the plant parasitic nematodes (suborder Tylenchina & Aphelenchina) of rapeseed fields in North Khorasan province, 40 soils and root samples were collected, during years 2007-2008. Nematodes were extracted by centrifugal flotation technique and transferred to glycerine. 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, 17 species belonging to 12 genera of the suborder Tylenchina & Aphelenchina were identified. Two species *Helicotylenchus egyptiensis* and *Paratylenchus perlatus* are reported for the first time from Iran. *Helicotylenchus egyptiensis* is recognizable from related species by the truncate lip region with five annulations, non functional spermatheca in female, lateral field with four lines, longitudinal inner together on the tail in a U or V shaped pattern, tail shape and its terminal projection. *Paratylenchus perlatus* is recognizable by short measurement (200-245 μm), long stylet (26-27 μm) and functional, spherical and small spermatheca.

Keywords: Plant Parasitic Nematodes, Rapeseed, North Khorasan

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Relationship between Phase Variation and Biofilm Formation Ability in Fluorescent Pseudomonads and Their Biocontrol Potentiality on Take-all Disease of Wheat Caused by *Gaeumannomyces graminis* var. *tritici*

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Abstract

Phase variation and biofilm formation ability in fluorescent pseudomonads play an important role in their biocontrol potentiality. These two phenomena increase adaptation and distributive ability of more fluorescent pseudomonads on the root during the growth of plant. Generally, as biofilm formation occur cells change phenotypically this could have determinant role in the control of various disease. In this research in seven of these bacterial strains including Um141, Um11, Um138, Um70, Um115, UmCHN5 and *pseudomonas fluorescens* F113 colonies with various morphology were observed. Results of this investigation on distribution pattern of the colonies both in sterilized condition and presence of *Ggt*, showed that these strains have been able to adopt themselves to root in various growing conditions and is able to reduce the rate of take-all disease. assay on the biofilm formation ability in these seven bacterial strains represented the high ability of these strains in the biofilm formation. However investigating on the rate of siderophore and hydrogen cyanide (HCN) production in these seven bacterial strains indicated that is no significant correlation between production of these two antifungal metabolites and decreasing of disease.

Keywords: Fluorescent pseudomonads, Phase variation, Biofilm formation, Root colonization *Gaeumannomyces graminis* var. *tritici*

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Investigation of Biology and Dynamism of Cottony Cushion Scale, *Icerya purchasi* Maskell in North of Iran

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Abstract

Cottony cushion scale, *Icerya purchasi* Maskell is one of the most important pests of citrus orchards in Mazandaran province and the east of Guilan province. The biology and dynamism of this pest was studied in orange trees, *Citrus sinensis*. Samples of 10 trees (from the end of twigs) were randomly taken weekly. The results indicated that the pest has two or three generations in a year in the west of Mazandaran province. In the first two years of this study, the first nymphal instars of the first generation were emerged in the late of May and the population peak was occurred in the early of July, while in the third year the population peak was observed in the middle of June. In the first two years of this study, in the second generation, the first nymphal instars were emerged in September and the population peaks was occurred in the late of September but in the third year the population peak of second and third generation were in the middle of August and in the early of October, respectively. The average fecundity was 645 ± 108 eggs. The eggs were hatched into crawlers in 12 ± 2 days and development time of first and second instars were 17 ± 4 and 20 ± 3 days, respectively. Cottony cushion scale was hibernated as second instar nymph, third instar nymph or adult female under leaves. The cardinal lady bird, *Rodalia cardinalis* Mulsant were scattered in citrus orchards, especially in gardens that did not receive periodic applications of herbicides and insecticides.

Keywords: Cottony cushion scale, Population dynamics, *Rodalia cardinalis*, Citrus

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Effects of Soybean (*Glycine max* L.) Cultivars Planting Date and Herbicides on Weed Species Density

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Abstract

In order to evaluate the effect of planting date of soybean cultivars in weed management, experimental design in the form of strip split plot as a randomized complete block design with three replications was conducted in Dasht-e-Naz Company Sari-Iran, in 2008. Treatments studied included three planting dates with a 20 days intervals (5 / 17, 6/ 6 and 2008/6/ 26) soybean cultivars (BP, JK, 032, 033 and Sahar) and weed control, including: 1 - Sonalan as pre-planting (3lit/ha) 2 - Sonalan as per-planting (3 lit/ha) + Sencore (Sonalan coincident) (700 g/ ha) 3 - Sonalan as per-planting (3 lit/ha) + Sencore (Metribuzin) as per-emergence (700 g/ ha) 4 – Control + Basagran as per-emergence (3 lit/ha) 5 – Treflan (Trifluralin) as per-planting (3 lit/ha) + Basagran as per-emergence (3 lit/ha) 6 – control. The results showed that planting date had a different effect on the density of either weed. The result also showed that Ethal-fluralin (Sonalan) can control narrow leaf weeds by alone. But combination of Ethal-fluralin (Sonalan) with Sencore (Metribuzin) whether pre-planting or pre-emergence can be control broadleaf weeds including wild melon (*Cucumis melo*), velvetleaf (*Abutilon theophrasti*), Sow thistle (*Sonchus oleraceus*) and nightshade (*Solanum nigrum*). These treatments also gave the highest seed yield. Between experimental cultivars, JK and 033 reduced density of wild melon. 033 also reduced the Barnyard grass (*Echinochloa crus-galli*) density. BP, Sahar and JK produced the highest yield, but BP had the highest yield in presence of weeds.

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

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The Investigation into Repellency Effects of Eucalyptus (*Eucalyptus camaldulensis*) Essential Oil on the Termite *Microcerotermes diversus*

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Abstract

Microcerotermes diversus Silvestri (Isoptera: Termitidae) is the most harmful termite species in Khuzestan province which causes damage to living plants and to wooden products in buildings. Using chemicals that are compatible with environment and with high potential to be used in integrated pest management programs, such as essential oils and plant extracts, is extremely important. In this study, two new models of olfactometer have been designed. This study investigated the repellency of Eucalyptus essential oil on *M. diversus* in olfactometer trials. Concentrations of the essential oil ranged from 0.3% to 1.6% (w:v). In the study of behavioral response to Eucalyptus oil using an olfactometer, the higher concentrations were used, the less termite movements to branches containing the essential oil were observed. Moreover, the results of different tests reveal that the highest amount of repellency effect of Eucalyptus essential oil (approximately 100%) induced by the concentration 1.6%. Overall, this study reveals that Eucalyptus essential oil may be suggested as an effective toxicant with suitable fumigant and repellent effects on the termite *M. diversus*.

Keywords: Eucalyptus essential oil, Olfactometer, Repellency, *Microcerotermes diversus*

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Management of Striped Stem Borer, *Chilo suppressalis* Walker on hybrid rice in the Paddy Field

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Abstract

In order to managing rice striped stem borer (*Chilo suppressalis* Walker) on Hybrid rice, a field study was conducted at the Rice Research Institute of Iran, Rasht during 2006-2007. The treatments were early planting, late planting, releasing of *Trichogramma* wasp, spray of Dazinon granular (10%), mixed of *Trichogramma* releasing with spray of Dazinon granular and control. Indexes of evaluation were number of larvae, percentage infection of Dead hearts (D.h), White heads (W.h) and yield in various treatments. The results showed that highest of infection D. was 1.78 to 0.77 percentage in control and early planting in vegetative stage receptively. Also, The highest W. h infection observed in control treatment and late-planted was from 3.32 and 2.49 percentage receptively. The highest of larvae average in vegetative stage observed in treatments of control and early planting. The most of larvae mean in reproductive stage showed in control. The highest of yield showed in releasing of *Trichogramma* wasp with apply of granular Diazinon (10%) about 7512.5 kg/ha during two years. At least of yield observed in checked and late-planted treatments with 4368.80 and 4580.90 kg/ha at this time receptively. This research showed the more suitable of method is mixed releasing of *Trichogramma* wasps with spray of Dazinon granular. By the way, average of crop loss due to in early planting in comparison with late planting was remarkable.

Keywords: Hybrid rice, *Chilo suppressalis*, Management

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Effect of Hexaflumuron and Spirodiclofen on Demography of *Hippodamia variegata* (Goez)(Col:Coccinellidae) Predator of, *Agonoscena pistaciae* Burckhardt and Lauterer Under Laboratory Conditions

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Abstract

The Lady beetle, *Hippodamia variegata* is one of the natural enemies of *Agonoscena pistaciae*. Demographic toxicology is a common method for evaluating sublethal effects of insecticides on natural enemies. Regarding to use of hexaflumuron and spiroadiclofen in pistachio gardens, present study conducted to evaluate the side effects of the pesticides on demographic parameters of *H. variegata* under controlled conditions ($26 \pm 1^{\circ}\text{C}$, $65 \pm 5\%$ RH and 16:8h L:D). For this purpose, 120 fresh eggs were treated with field recommended concentration of insecticides and treated into Petri dishes 6 cm with distilled water was used as control, by dipping method. Results has shown that there were significant differences among treatment for gross reproductive rate (GRR), net reproductive rates (R_0), intrinsic rate of increase (r_m), finite rate of increase (λ), intrinsic birth rate (b) and doubling time (DT) parameters. The gross reproduction rates were estimated 24.43 ± 0.38 , 55.67 ± 0.49 and 48.11 ± 0.66 in hexaflumuron, spiroadiclofen and control respectively. In addition, r_m were estimated 0.086 ± 0.0067 , 0.1086 ± 0.0045 and 0.1232 ± 0.007 , Moreover, DT values were recorded as 8.62 ± 0.51 , 6.54 ± 0.25 and 5.88 ± 0.29 as above mentioned, respectively. According to this experiments, hexaflumuron had higher negative effect on intrinsic rate of *H. variegata* and it will be suggested that to be considered in integrated pest management.

Keywords: *Agonoscena pistaciae*, Demographic parameters, Hexaflumuron, *Hippodamia variegata*, Life table, Spirodiclofen

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Study on Status of Arbuscular Mycorrhizal Fungi Associated with Barley in Damghan Region, Iran

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Abstract

This study was carried out in order to identification, spore population abundance, diversity pattern, determination of colonization index as well as arbuscular mycorrhizal fungal species morphological diversity in barley (*Hordeum vulgare*) rhizosphere in Damghan region. Sampling was done in May, June and July of 2009 from different barley fields in Damghan region. Sampling areas were classified to 7 parts and 44 composite soil samples collected. Spores of arbuscular mycorrhizal fungi were observed in all of collected soil samples. The spores population was 72-840 spors per 35g dry soil. The most average number of spores belonged to southern parts of Damghan (349.73 spores) followed by Northern, South east, North east, Western, Eastern and North west parts, respectively. Mycorrhizal frequency (F%) was 100% in all sampling areas except of region 3 (97.5%). On the other hand, Mycorrhizal intensity (M%) was varied from 24.06% in region 7 up to 69.2% in region 5. Species richness was also 7 species in region 5 and 12 species in region 6. In this study 16 fungal species were identified in barley rhizosphere from Damghan region which 13 species of them belonged to *Glomus* genus and only 1 species was identified in each genus including *Acaulospora*, *Pacispora* and *Scutellospora*. The *Glomus* was the prevalent genus in Barley rhizosphere in Damghan region. *G. corymbiforme* and *G. trimurales* were reported for the first time in Iran. The most and least relative abundances were observed on *G. intraradices* (12.66%) and *Pacispora scintillans* (1.99%), respectively.

Keywords: Arbuscular mycorrhizal fungi, Barley, Colonization, Identification, Morphological diversity

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Comparison of Contact Toxicity of Three Formulations of Lambda- cyhalothrin against German Cockroach First- instar Nymphs, *Blattella germanica* (L.) (Blattaria: Blattellidae)

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Abstract

German cockroach, *Blattella germanica* (L.) is a major worldwide household insect pest. Cockroaches play an important role as mechanical vector agents of pathogens. Also, their secretions act as main allergens of allergic diseases like asthma. The use of various formulations of conventional insecticides remains an integral part of pest management programs for the German cockroach. Contact toxicity of three commercial formulations of lambda-cyhalothrin including wettable powder (ICON[®] 10 WP), microcapsule (DEMAND[®] 10 CS) and emulsifiable concentrate (ICON[®] 5 EC) were examined against first instar nymphs of *B. germanica*. Experiments were conducted at 27±2 °C, 60±10% R.H and a photoperiod of 12:12h (L:D). Six concentrations of each formulation were assayed by ten replications. The mortality of nymphs was increased as consequence of rising the concentrations. The WP formulation had the most effectiveness and its LC₅₀ value was 4.99 mg ai. m⁻². The CS and EC formulations attained LC₅₀ values of 5.81 and 6.98 mg ai. m⁻², respectively. The results demonstrated that the WP formulation had highest potential for control of the German cockroach.

Keywords: *Blattella germanica*, Lambda-cyhalothrin, Wettable powder, Microcapsule, Emulsifiable concentrate

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Simulation of Emergence Pattern of Weeds Species in Corn (*Zea mays L.*) Field Based on Sigmoidal Models

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Abstract

The application time of weed control methods due to population dynamics of this species is One of the most important aspects of weed management. In this study tried to use four sigmoidal functions (Logistic, Gompertz, Richards and weibull) and to select the best fit by using R^2_{adj} , RMSE and AICc. Our results showed that the seedling models of every weed are different from one another and the majority of all weeds emerge in 20 days after maize planting. After fitting the models and their calculated parameters, Richard 4 paramete model was excluded from comparisons.results showed that Logistic, Gompertz and Weibull models were the best model to show the pattern of emergence for *Amaranthus retroflexus* and *Echinochloa crus-galli*, *Chenopodium album* and *Solanum nigrum* and *Portulaca oleracea* Respectively. In this species the start of germination process occurred after planting the desired crop immediately. 50% germination in the 175 to 318 degree days (2 to 4 weeks after planting) occurred.

Keywords: Thermal-Time, Logistic, Gompertz, Weibull models, Time of control

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Investigation of metribuzin degradation in soil and the effect of organic manure on its degradation and half life

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Abstract

To study metribuzin degradation in soil and the effects of manure amendment on its half life, an experiment was conducted in completely randomized design with factorial arrangement and three replications. Treatments included cattle manure amount at four levels (0, 1, 5 and 10 based on soil percentage weight), and soil incubation periods at 7 levels (0, 2, 4, 8, 16, 36, 64, 90 days). According to the results, average metribuzin degradation was 69.22% in soil without cattle manure amendments and increasing the 1, 5 and 10% manure decreased metribuzin residue by 64.69, 64.42 and 64.91% respectively. Soil incubation period had very significant effect ($p < 0.01$) on metribuzin degradation. By increasing soil incubation period, metribuzin residue decreased significantly. Metribuzin soil residue was 59.12, 38.18 and 28.55 percent, after 36, 64 and 90 days incubation period, respectively. Using 1, 5 and 10 percent cow manure amendment to soil, decreased metribuzin half life from 85.57 days to 47.80, 57.28 and 38.08 days, respectively. According to these results, cattle manure can increase metribuzin degradation in soil and decrease its half time. However, low level of organic matter in Iranian soil, is a problem. It seems that organic manure application influences metribuzin bioremediation in soil and decreases its negative effects.

Keywords: Biological degradation, Manure, Residue

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Evaluating the Allopathic Effects Hoery Cress (*Cardaria draba*) Organs Extrate on Germination and Seedling Growth of Triticale

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Abstract

Allelopathy is the main factor of weed interference on growth and development of crops. In order to study of allopathic effect of hoery cress organs extrate on germination and seedling growth of Triticale, two separate factorial experiment based on randomized complete block design with four replication were conducted under laboratory and green house conditions. Treatment were included of extract organs of hoery cress root, stem, leaves and equal amount of their mixture at concentration, 10, 20, 40 and 80 % with control (distilled water) Result showed that different organs extrate at performed concentrations in both laboratory and green house conditions had significant effects on germination and early seedling growth compare with control. In laboratory experiment, the length of plumule and number of seminal roots compare with control were decreased of about 88% and 74%, respectively. The same result was observed. When concentration of different organs increase above index decrease significantly. Also compare different hoery cress aqueous extract showed that stem extrat had more inhibitory effect on germination and seedling growth.

Keywords: Allelopathy, Chemicals, Glucosinolate, Hoery cress, Plumule

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Brief report
First Record of *Allodynerus dignotus* (Morawitz,1895)
(Hym: Vespidae: Eumeninae) from Iran

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Abstract

The order Hymenoptera with more than 115000 described species, includes over 10% of species diversity in the world. These insects are one of the most important groups in economic and ecological terms. Vespidae family plays an important role in biological control of some insect pests. This family includes six subfamilies and almost 4150 known species in the world(Carpenter,1982). These insects are small to medium size, and 4.5 to 29 mm in length, with varoious colors and almost in black and yellow colors. Thirteen segment antenna of males has a more curved in end contrast to twelve segment antenna of females curve. The inner edge of compound eyes is notched and kidney shaped.(Abbasi, 1385). The subfamily of Eumeninae is called Potter wasps or Mason wasps. During the survey on the species of this family in Mashhad and its suburbs, a male of *Allodynerus dignotus* (Morawitz,1895) from Eumeninae subfamily is reported from Iran for the first time.

Keywords: Hymenoptera, Vespidae, Eumeninae, *Allodynerus dignotus* (Morawitz,1895), Iran

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Brief report
**The First Report Damage of *Succinea putris* L. (*Mollusca:Pulmonata:*
Succineidae) From Mazandaran Rice Nurseries**

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Abstract

Succinea putris L. (Mollusca: Pulmonata: Succineidae) were collected from the rice nurseries in Mazandaran province during 2005. This species by feeding on rice seedlings leaves is another pest of growing rice in nursery. Symptoms of early feeding are a row of circular continuous holes on lamina and eventually led to leave loss. The high density of snails in the nursery cause loss of large number of transplants and decrease in product quantity. Although this species already in snail fauna investigation of rice fields were collected and identified but its damage to rice is reported for the first time in Mazandaran province.

Keywords: Rice, Nursery, *Succinea putris*, Damage

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Brief report First Report of Three Pteromalid Wasps from Iran

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Abstract

The family of Pteromalidae (Hym: Chalcidoidea) is one of the largest families of Parasitic wasp. Members of this family wasp comprise of important natural enemies of many harmful insects in major insect orders such as Coleoptera, Diptera, Lepidoptera, Hymenoptera and Homoptera; Therefore they have an important role in biological control of agricultural pests. The chalcid wasps belonging to this family was collected in Kurdistan Province (in the West of Iran) during 2010 and 2011. Three Species of collected Pteromalidae wasp has been reported as new records from Iran. Species of *Oodera monsterum* (Nikolskaya, 1952), *Stenoselma nigrum* (Delucchi, 1956) and *Conomorium amplum* (Walker, 1935) was reported as new records from Iran.

Keywords: Kurdistan, Pteromalidae, Biological control, Parasitoids

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