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جلد ۲۶، شماره ۳، پاییز ۱۳۹۱، ص. ۲۹

The Effect of *Artemisia annua* L. (Asteraceae) Essential Oil on Detoxify Enzymes of Two-spotted Spider Mite, *Tetranychus urticae* Koch (Acari: Tetranychidae)

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Abstract

Tetranychus urticae Koch is an important and destructive pest of crops, fruits and ornamental plants in worldwide. The high fecundity of *T. urticae* and its abruptly life span as well as the extensive application of acaricides for keeping *T. urticae* damages below economic injury level, caused to resistance to acaricides and control failures. In this research the fumigant activity of essential oil vapours distilled from *Artemisia annua* L. was tested against adults of *T. urticae*. The results of bioassay indicated that LC_{50} of essential oil on adults was 1.13 µl/l. Also the effect of several concentrations (0.5, 1, 1.7 and 3) was surveyed on esterase and glutathione-S-tarnsferase activity and monooxygenases content. Results showed that essential oil concentrations were reduced esterase and glutathione-S-transferase activity and monoxygenases content. The inhibitory effects of essential oil were also evaluated on esterases patterns in PAGE. Results revealed that two bands of esterase were detected in control and when essential oil concentrations were increased, the esterase activity was more inhibited. Band intensity was decreased with increasing in concentration.

Keywords: *Tetranychus urticae*, Esterase and glutathione-S-transferase activity, Monooxygenases system, *Artemisia annua* essential oil

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Barely Weed Species (*Hordeum* spp.) Response to Sulfosulfuron at Different Rates and Times of Applications

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Received: 19-02-2009
Accepted: 29-06-2012

Abstract

This experiment was conducted at Research Green-house, Department of Weed Research, Iranian Plant Protection Institute, to evaluate the efficacy of sulfosulfuron rates in controlling of barely weed species (including *Hordeum murinum, H. spontaneum, H.distincho*m, *H. vulgar*) in the 2007. First factor was different times of sulfosulfuron application including 2, 4, 6, 8 and 10 leaf stages and the second factor was different sulfosulfuron application rates (0, 13, 26, 39 and 52 g ha^{-1}). The experimental type was completely randomized blocks with factorial arrangement and four replications. According to the results, sulfosulfuron at the recommended time 2 to 6 leaf stages provide acceptable control of the wild barely (*H. spontaneom*). These stages were increased to 8 leaves stage for mouse barely (*H. murinum* L.) and *H. vulgar*. But, it was 2 to 4 leaves stage for *H. distincho*m. However, it did not need to increase the rate due to appropriate time of sulfosulfuron application and complete control of weeds was achieved with the recommended rate (27 g ai ha^{-1}). On the whole, delay of mentioned application times caused increasing the sulfosulfuron rate and these rates depend on application time and weed species.

Keywords: Application rate, Application timing, Sulfosulfuron, Weed barely Control

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Effects of Redroot Pigweed (*Amaranthus retroflexus*) on Yield and Yield Components of Soybean

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Abstract

In order to study the effect of different redroot pigweed (*Amaranthus retroflexus*) density on yield, yield components of soybean cultivar and determining competitive cultivar, a field experiment was carried out at Mazandaran agricultural research station 2006. Experiment was set up at a Randomized Complete Block Design with five rates of pigweed (0, 4, 8, 12 and 16 plant per square meter) and three cultivars of soybean (Telare, Sari and Sahare) in factorial arrangement with four replications. For calculating pod loss, number of seed per pod, 100 seed weight and yield; three parameter Cousense equation were employed. The results showed that, there were an inverse relationship between pigweed density and number of pod, seed per pod and 100 seed weight. The number of pod and 100 seed weight of grain decreased with increasing of the weed density, but the rate of pod number and 100 seed weight decrease in low pigweed density were more, than high density of pigweed. For this reason the relation between pigweed density with pod number and 100 seed weight was not linear, because in higher densities of pigweed by initiating intra-specific competition, the rate of competition reduced between weed and soybean, but between seed per pod and pigweed density there was a decreasing linear relation. The rate of number of pod per plant and weight of 100 seed decrease reduced with increasing the weed density. The soybean yield loss in 16 pigweed plant density in Sari, Telare and Sahare were 46.33%, 57.4% and 58.31% relative to the weed control, respectively. In conclusion the competition ability of Sari was more than other cultivars, and the amount of yield loss was lesser than Telar and Sahar cultivar.

Keywords: Competition, Soybean, Pigweed, Density, Cultivar

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جلد ۲۶، شماره ۳، پاییز ۱۳۹۱، ص. ۳۲

Results of Screening on 89 Apple Cultivars for Fire Blight Resistance Using USDA System in Karaj Conditions

H. Hajnajari [1]

Received: 06-04-2011
Accepted: 24-06-2012

Abstract

Fire blight disease caused by *Erwinia amylovora* is a destructive disease of pome fruits including apple worldwide. Use of resistant cultivars is the most efficient method of disease control. In the present research, we investigated genetic resistance of 89 local and imported commercial apple cultivars in natural contaminated conditions to the bacterial disease using Beltsville scoring system (USDA) in horticulture Research station of Kamalshahr, Karaj (Iran), during triennial observations, 2007-2009. Apple cultivars differed significantly (P<1%) in their resistance to fire blight. Among 89 apple cultivars under study, 19 (21%) were scored as highly resistant, 51 (57%) moderately resistant, 17 (19%) intermediate, 2 (2%) moderately susceptible and none highly susceptible. Local commercial cultivars of Mashhad Nouri, Sheikh Ahmad and new released cultivar Sharbati, registered in national cultivar registration office, along with imported cultivars of Northern Spy, Hi-Early, Cooper Spur, Early Red One, Red Chief, Prime Gold and Red Spur were scored as highly resistant. The most disease severity (P<0.01) occurred in year 2008.

Keywords: Apple cultivars, *Erwinia amylovora*, Fire blight, Native, Resistance

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جلد ۲۶، شماره ۳، پاییز ۱۳۹۱، ص. ۳۳

Species of Two Genus *Geocenamus* and *Merlinius* of Rapeseed Fields in North Khorasan Province

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Received: 01-01-2011
Accepted: 13-09-2011

Abstract

In order to identify the plant parasitic nematodes of rapeseed fields in North Khorasan province, during 2007-2008, 40 soils and root samples were collected. Nematodes were extracted by centrifugal flotation technique and transferred to glycerine 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, from genus *Geocenamus*, three species *G. quadrifer, G. tessellates, G. rugosus* and genus *Merlinius* four species *M. brevidens, M. microdorus, M. nanus,* and *M. nothus* were identified. *G. tessellates,* is reported for the first time from Iran.

Keywords: *Geocenamus, Merlinius,* Rapeseed, Plant parasitic nematodes, North Khorasan Province

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جلد ۲۶، شماره ۳، پاییز ۱۳۹۱، ص. ۳۴

Response of Wild Barley (*Hordeum spontaneum*) and Wheat (*Triticum aestivum*) to Different Herbicides in Greenhouse

Names?[1]

Received: 05-02-2011
Accepted: 15-01-2012

Abstract

In order to study the response of wheat (*Triticum aestivum*) cv. Chamran and wild barley (*Hordeum spontaneum*) to different herbicides, a pot dose response experiment was conducted in a completely randomized design with three replication at Research Greenhouse of Ferdowsi University of Mashhad in 2008. Different doses of herbicides including Clodinafop propargyl, Pinoxaden, Sulfosulfuron, and Metsulfuron-methyl+ Sulfosulfuron, were applied post-emergence at 2-3 leaf stage of wheat and wild barley and Isoproturon+Diflufenican was applied pre-emergence. Plant dry weight of each treatment was determined three weeks after herbicide application, then GR_{50}, GR_{25}, and herbicide selectivity indices were determined for each herbicide. Results showed that due to wild barley high tolerance, no herbicide could completely control this weed in wheat without injury to wheat. Among all herbicides, Metsulfuron-methyle+Sulfosulfuron was the best one for selective control of wild barley in wheat, which reduced wild barley biomass by 32% in recommended dose. Clodinafop propargyl and Pinoxaden, even at higher doses couldn't reduce wild barley biomass and can not be used for wild barley control in wheat. Sulfosulfuron had little influence on wild barley at recommended dose, but at higher doses reduced both wild barley and wheat biomass significantly.

Keywords: Dose response, Chemical control, Grass weed, Herbicide tolerance

1 -?

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جلد ۲۶، شماره ۳، پاییز ۱۳۹۱، ص. ۳۵

Study of Relative Distribution of *Polymyxa betae* Keskin by Microscopic and Molecular Methods Along with Possibility of Tranfering by Dominant Weeds of Sugar Beet Farms in Razavi and Northern Khorasan Provinces

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Received: 07-06-2011
Accepted: 14-04-2012

Abstract

Genus *Polymyxa*, belongs to Plasmodiophoromycota Phyllum and Protozoa Kingdom. This fungus is a obligate endoparasite in the root cells of vascular plants. Since the two species of this genus, *P. graminis* and *P. betae* are both known to carry destructive viral agents to sugar beet and Poaceae. For studying the distribution of infected fields with *P. betae* in Razavi and Northern Khorasan provinces, 39 soil samples were taken from sugar beet fields in the two provinces. Then in Collected soils, sugar beet seeds (IC) were planted and after 5 to 7 weeks, the growing plants were removed from the soils and with using two methods (Microscopic and Nested PCR) the rate of contamination to *P.betae* was evaluated in different fields.The results showed that this fungus was detected in 59 percent of tested plants by Microscopic method and in 75. 3 percent of samples tested by molecular method. In planting 18 species of dominant weed seeds of sugar beet and wheat fields in contaminated soils ,the hosting possibility of these plant species were investigated by using two Microscopic and Molecular methods in the both provinces. Among these weeds *Chenopodium album, Amaranthus retroflexus, A.viridis , Portulaca oleraceae and Convolvulus arvensis* were hosts, and *Chenopodium album* and *Convolvulus arvensis* varieties were introduced as alternative hosts of this fungus.

Keywords: *Polymyxa betae*, Nested PCR , re-transmission , The dominant weeds in sugar beet fields

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Occurrence of Resistance in Grapevine Powdery Mildew (*Erysiphe necator)* to Azoxystrobin + Difenconazole (Ortiva®) and Cross Resistance to Penconazole and Hexaconazole in Khorasan Razavi Province

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Received: 11-06-2011
Accepted: 20-03-2012

Abstract

Thirty seven isolates of *Erysiphe necator* were collected from different vineyards from three regions and nine cities of Khorasan Razavi province within two time periods i.e. May to June and August to September 2009. Their resistance to azoxystrobin + difenconazole (Ortiva®) fungicide as well as cross resistance to penconazole and hexaconazole fungicides registered in Iran for the control of powdery mildew was investigated. A leaf disk bioassay was carried out to determine the resistance of powdery mildew isolates on the basis of EC_{50} values derived from log-logistic dose-response curves. These subcultures were analyzed for resistance to azoxystrobin + difenconazole. The mean EC_{50} values of azoxystrobin + difenconazole on *E. necator* subcultures from vineyards was 0.279 mg L^{-1}. The highest and the lowest EC_{50} values were found in Mashhad (0.622 mg L^{-1}) and Khalilabad (0.143 mg L^{-1}), respectively. Frequency distributions were skewed most toward higher resistance to azoxystrobin + difenconazole. The present study demonstrated a steady and significant increase in EC_{50} values for azoxystrobin + difenconazole during the growing season after multiple applications. Also, there was no cross resistance ($P > 0.05$) among fungicides.

Keywords: *Erysiphe necator,* Fungicide, Grapevine, Powdery Mildew, Resistance

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Toxicity and Oviposition Deterrent Activities of Exocarp and Kernel of *Ginkgo biloba* Seed Extracts Against *Tetranychus urticae* Koch.

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Received: 05 -07-2011
Accepted:01-05-2012

Abstract

Toxicity and oviposition deterrent activities of ethereal extracts of exocarp and kernel of Ginkgo biloba seed were evaluated on various life stages of two spotted spider mite Tetranychus urticae. Petroleum ether was used for extraction. Bioassay was conducted using three replicates for testing five concentrations 35, 45, 60, 75 and 100 g/l of pure extracts. LC50 was measured by Pri-Probit software. Effect of extracts on various life stages of mite was measured using randomized complete block design (RCBD) with three replicates. The result indicated that extract of the exocarp and the kernel lead to mortality in various stages of mite. The Most sensitive stage was nymphal stage. Lowest LC50 value (39.82 mg/ml) and highest one (48.27 mg/ml) related to the exocarp and the kernel extracts, respectively. However, there was no statistical difference between effects related to extract of exocarp and kernel. These extracts reduced the oviposition to 3.5 and 4.1 eggs/day as well as the oviposition period which diminished to 8.9 and 8.1 days, which in comparison to control (9 eggs/day, 16 days) this reduction equivalent to 60% and 50%, respectively. Since exocarp is removed during drug production from ginkgo seed, this production waste can be used as a source for pesticide compounds production.

Keywords: Ginkgo biloba, Ethereal seed extract, Bioassay, Two spotted spider mite, Mortality, Ovicide effect, Oviposition deterrent

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The Effect of Some Pesticides and Plant Extracts on Functional Response of *Chrysoperla carnea* (Stephens) to Different Densities of *Agonoscena pistaciae*

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Received: 28-08-2011
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Abstract

Functional response in natural enemies is affected not only by host and natural enemy characteristics but also, the application of pesticide to pest population can affected the parameters of functional response as well as efficiency of natural enemy. In this research, the side effects of two pesticides, hexaflumuron and pymetrozin and also acaricide spirodiclofen and plant extracts, *Caiotropis procera* (Willd.) R. Br. (Asclepiadaceae)*, Teucrium polium* (Labiatae)*, Fumaria parviflora* Lam. (Fumariaceae) and *Thymus vulgaris* L. (Labiatae) were studied on functional response of 3rd instars larvae of *Chrysoperla carnea* at 26±1°C, 60±5% RH and 16:8 (L: D). Different densities levels (2, 4, 8, 16, 32, 64 and 100) of the 5th instars of common pistachio psylla nymphs *Agonoscena pistaciae* were placed on pistachio leaf disc with 65 mm diameter. Treatment of larvae were carried out using dipping method by maximum recommended field rates for pesticide and selected concentration of plant extracts (750 µl/ml). Functional response type was determined using logistic regression and the parameters, searching efficiency (a) and handling time (T_h) were estimated by non-linear regression using SAS software. Functional response was type III in *F. parviflora* treatment and type II in others. Functional response in *T. vulgaris* was not diagnosed. The lowest and the most searching efficiency were in *C. procera* treatment (0.0377) and control (0.1209) respectively. Handling time was the lowest in *C. procera* treatment (0.00177 h^{-1}) and the most in hexaflumuron (0.3132 h^{-1}). It could be concluded that pesticide and plant extracts can affect the predation value and functional response of *C. carnea* to common pistachio psylla. This effect to control, sometimes as a functional response III and loss of searching efficiency is positive.

Keywords: *Agonoscena pistaciae, Chrysoperla carnea,* Functional response, Pesticides, Plant extracts

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Effect of Essential Oils of *Lavandula angustifolia and Zataria multiflora* on Inhibition of Reproduction and Progeny Production of *Callosobruchus maculatus* (F.)

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Received: 30-08-2011
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Abstract

Inhibitory effects of *Lavandula angustifolia* and *Zataria multiflora* essential oils were evaluated on reproduction and F_1 progeny production of *Callosobruchus maculatus*. Insect's culture and bioassays were conducted at 29 ±1ºC, 60±5% RH and dark condition. Essential oils were taken by hydrodistilation. The results indicated that there was a negative and significant linear relationship between reproduction of beetles and oil concentration. Similar relationship was found between F_1 progeny and oil concentration. Comparison of regression slopes showed that *L. angustifolia* oil was more effective than *Z. multiflora* oil on reproduction and F_1 progeny population. The essential oils analysis by GC-MS showed that the main compounds of *Z. multiflora* oil were Thymol (55%), Linalool (37.8%) and *p*-Cymene (7.2%) and those of *L. angustifolia* oil were Linalool (42.8%), 1, 8-Cineol (23.4%), Rosefuran epoxide (14%), Menthone (6.8%), Isomenthol (5.2%) and Dihydro carvone (trans) (4.3%). The results indicated that these essential oils especially *L. angustifolia* oil might be suitable alternatives for stored products protection against *C. maculatus*.

Keywords: Essential oils, F_1 progeny reduction, *L. angustifolia*, Reproduction inhibitory, *Z. multiflora*

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Study on Morphological, Molecular and Biological Characteristics of the Conifer Aphid, *Cinara pini* Linnaeus (1758) (Hem.: Lachnidae) under Greenhouse Conditions

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Received: 23-10-2011
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Abstract

During a survey on pests of pine trees, *Pinus mugo* Turra, in April 2010 in Mashhad, a colony of an aphid was observed in abundant populations on the seedlings, belongs to the subfamily Cinarinae and family Lachnidae, being identified as *Cinara pini* (Linnaeus, 1758). The blast sequence to *C. pini* in the gene bank showed that the species was most similar to *C. atlantica* with 93% similarity. The mean length of adults was 2.69± 0.06 mm. The base of last antennal segment has fewer than 4 setae. The final rostrum segment is longer than the basal diameter of cornicles or slightly longer than the second tarsal segment of hind legs. Investigations on the biology of the aphid under greenhouse conditions of 25±2 ˚C, 45±5 RH, and 16:8 (L:D) showed that prematurity development time lasted 10 days. Intrinsic rate of increase (r_m) was 0.197 ♀/♀/day and the net reproductive rate (R_0) was 30.67 ♀/♀/generation. The reproductive period of aphids was 12.61 days during which a total of 36.75 nymphs per female were deposited. The total length of a generation was 26.20 days.

Keywords: *Cinara pini*, Intrinsic rate of increase, Population growth parameters, Conifer

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جلد ۲۶، شماره ۳، پاییز ۱۳۹۱، ص. ۴۱

Brief report
First Records of Two Spider Mite Species (Acari: Tetranychidae) in Iran

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Received: 31-10-2010
Accepted: 29-05-2012

Abstract

During a faunistic survey on mites associated with fruit trees in Birjand region (South Khorasan Province) in 2010, specimens of two injurious mites were collected. Using literature, specimens were identified and confirmed by Dr. O. Seeman (Australia). As a result, two species, namely *Schizotetranychus sayedi* Attiah, 1967 collected from fig, almond, grape, apple and apricot in Fodaj, Alghorat, Nowferest and Hasan Abad, and the species *Tetranychus schoenei* McGregor, 1941 from almond, grape, apricot, plum and apple in Amir Abad, Alghorat, Shams Abad and Hasan Abad, are new for fauna of Iran.

Key words: Fauna, Phytophagous mites, Fruit trees

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Brief report
First Report of Two Lygaeids, *Geocoris acuticeps* Sign. and *Plinthisus longicollis* Fieb. Infauna Iran

N. Zeinaddini Memand[1*]- M. Moddares Awal[2]- J. Karimi[3]

Received: 23-07-2011
Accepted: 07-03-2012

Abstract

Lygaeids is a family of Heteroptera with more than 4000 known species in the world as one of the biggest true bug families with diverse habitats. In this research, some specimens of Lygaeidae from different districts of Rafsanjan (Kerman province) were collected. Species identification was based on different identification keys and the final confirmation was done by Dr. Rauno E. Linnavuori in Finland. Among the collected species, *Geocoris acuticeps* Sign. and *Plinthisus longicollis* Fieb., are recorded here for Iran as first reports. These species belong to the Geocorinae and Rhyparochrominae subfamilies.

Keywords: Lygaeidae, Fauna, Rafsanjan, Iran

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