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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۱۸

Optimizing Efficacy of Clodinafop-propargyl with Adjuvants on Little Seed Canary Grass (*Phalaris minor* Retz.) Control

M. Kargar[1*]- M.H. Rashed Mohassel[2]- A. Nezami[3]- E. Izedi Darbandi[4]

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Abstract

Optimizing the herbicide dose by the addition of adjuvants is an acceptable way to increase performance and to reduce the risk of side effects from herbicides. Therefore, to detect a suitable adjuvant for clodinafop-propargyl against little seed canary grass (*Phalaris minor* Retz.). Greenhouse experiment were conducted as factorial in completely randomized design with four replications for compare effect of citogate surfactant, castor oil, rapeseed oil and detergent liquid. The treatments consisted herbicide factor in 6 levels (0, 8, 16, 32, 48 and 64 g a i h^{-1}) and adjuvant factor at 3 levels (0, 0.1 and 0.2) percent by volume (%*v/v*), respectively. More over, in experiment separately as factorial in completely randomized design with 4replications,theeffect of adjuvant concentration sat 8 levels (0, 0.01, 0.05, 0.1, 0.15, 0.2, 0.25 and 0.3) percent by volume (% *v/v*) on surface tension of aqueous solutions of the adjuvants was determined. Based on results of experiment, the minimum and maximum surface tension was obtained from citogate and rapeseed oil solutions respectively. All additives increased clodinafop-propargyl herbicide performance in dry weight and survival percentage. The amount ofED_{50}decreased and relative potency (R) increased. Most of the other adjuvants, citogate surfactant in creasedclodinafop-propargyl herbicide performance and then was castor oil. After that it rapeseed oil and liquid detergent was too late. With increasing adjuvant concentration of 0.1 to 0.2 (% *v/v*) foliar activity of the tested herbicide (potential relative) increased.

Keywords: Liquid detergent, Surface tension, Surfactant, Vegetable oil

1,2,3,4- PhD Student, Professors and Assistant Professor, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively
(*- Corresponding Author Email: kargar61@gmail.com)

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۱۹

Examine of the Sensitivity and Total Phenol Changes of Stone Fruit Different Cultivars to *Monilia laxa* Pathogenic

M. Gharekhani[1] – M. Salari[2*] – S. Nasrollanejad[3] – N. Panjehkeh[4] – S.K. Sabbagh[5]

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Abstract

Development of effective strategies for management of brown rot disease to obtain an accurate knowledge of the response of different cultivars to the pathogense takes. For study the percentage of the natural blooming in the garden and the change of total phenol amount in laboratories in different cultivars of Stone fruit in response to the *Monilia laxa* (Honey) fungal pathogen, study was carried out in from a completely randomized design whit 17 treatments and 3 replications and a factorial arranged construction completely randomized design with 9 treatments and 3 replications in four times (24, 48, 96 and 144 hours), respectively after inoculation was performed. For measurement of the total phenolics in the leaves used of Seevers and Daly's method by folin reagent and for prepare standard curve used of gallic acid. Means comparisons were performed by using the Duncan's method. The results showed that there were a significant difference at 1% level between the different varietiew of stones of the response to the causal agent of brown rot. Mean while, Plum green gage whit a mean of 98% of the pollution in the group a was sensitive and Plum Santaroza mean %10/333 infection in group c was the most resistance of them. The results showed that the total phenol content of total phenolics among cultivars has shown a significant difference at 1% level. Cultivars of apple Nectarine with an average 12/848 µg produces the largest amount of phenol and saffron Peach and sixty days peach with an average of 10/038 and 9/7 microgerams/g^{-1} leaves have the least of phenolic compounds respectively placed in groups A, E and F.

Keywords: Stone fruits, Sensitivity, Total phenol, *Monilia laxa*

1,2,4,5- Graduate MSc, Associate Professors and Assistant Professor, Department of Plant Protection, Faculty of Agricultural, University of, Zabol, Iran
(*- Corresponding Author Email: salari21m@yahoo.com)
3- Associate Professor, Department of Plant Protection, Faculty of Agronomy Sciences University of Agricultural and Natural Resources, Gorgan, Golestan, Iran

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۰

Optimizing the Efficacy of Clodinafop-Propargyl to Control Littleseed Canarygrass (*Phalaris minor* Retz.) with the Vegetable Oils

M. Shareatmadari Tehrani[1]- S.M. Nabavi[2]- M. Bazobandi[3]- H. Hammami[4]*- A. Aliverdi[5]

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Abstract

In order to comparing influence of ten vegetable oils for optimizing clodinafop-propargyl efficacy, a greenhouse experiment of dose-response including 0, 8, 16, 32, 48, and 64 g a.i. ha^{-1} of clodinafop-propargyl at eleven level of without vegetable oil and with vegetable oils of sunflower, soybean, canola, turnip, cotton, sesame, bitter almond, sweet almond, castor and olive in control of littleseed canarygrass (*Phalaris minor* Retz.) with four replications was done. Results showed that all of the vegetable oils significantly reduced the surface tension and subsequently improved the efficiency of herbicide to control littleseed canarygrass. The performance of the vegetable oils were sunflower > rapeseed > soybean > cotton > olive > canola > bitter almond > sesame > castor > sweet Almond according to dry weight and rapeseed > sunflower > soybean > cotton > bitter almond > olive > canola > sesame > castor > sweet almond according to fresh weight. The overall results showed that with increasing content of saturated fatty acids of vegetable oils, decreasing power for surface tension decreased but herbicide performance increased. Accordingly, therefore, an increase in the penetration of a.i. by vegetable oils via softening or disrupting of the cuticular waxes is a more effective factor than a decrease in the surface tension of spray droplets.

Keywords: Surface tension, Herbicide, Littleseed canarygrass, Vegetable oils

1,2,3- Former MSc Student of Weed Science, and Assistant Professors, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Mashhad Branch, Islamic Azad university, Iran
4,5- PhD Students, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad
(*- Corresponding Author Email: homamihossein@gmail.com)

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۱

Effects of Type and Different Nitrogen Rates on Egyptian Broomrape (*Orobanch aegyptica*) Control in Tomato (*Lycopersicon esculentum*)

K. Orooji[1]*- M.H. Rashed Mohassel[2]- P. Rezvani Moghadam[3]- M. Nassiri Mahalati[4]

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Abstract

To study the effect of type and different nitrogen fertilizers on controlling Egyptian Broomrape, field and greenhouse studies based on randomized complete block with three replications, were conducted at Ferdowsi university of Mashhad. Greenhouse study treatments were consisted of ammonium nitrate, ammonium sulfate and urea each of which applied at four rates (75, 150, 300 and 350 kg/ha). Field experiment treatments were included of ammonium nitrate, ammonium sulfate and urea, applied at three rates (150, 300 and 350 kg/ha). The result of greenhouse studies indicated ammonium nitrate and urea (at all of rates) reduces Orobanch infestation about 80 percent. Ammonium nitrate and urea at (300 kg/ha) were increase tomato dry weight compare to the control. The field study findings too indicated that ammonium nitrate (300 kg/ha) was the most effective treatments in increasing tomato yield and produced highest yield (53 t/ha). Ammonium sulfate strongly decreased tomato biomass plants in greenhouse study but in field conditions produced yield same control. In conclusion we may suggest that applying ammonium nitrate fertilizer could effectively control broomrape in tomato and improve tomato growth and biomass.

Keywords: Ammonium nitrate, Ammonium sulfate, Parasitic weeds, Urea

1,2,3,4- PhD Student and Professors, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively
(*- Corresponding Auteur Email: kobra.orooji@gmail.com)

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۲

Chemical Control of Broomrape (*Orobanche aegyptiaca*) in Tomato (*Lycopersicon escolentum*) by Glyphosate and Sulfosulfuron

S. Tokasi[1]*- M. Bannayan Awal[2]- H. Rahimiyan Mashhadi[3]- A. Ganbari[4]- E. Kazerooni Monfared[5]- P.N. Kudsk[6]

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Abstract

For investigating of *O. aegyptiaca* control in tomato with sulfosulfuron and glyphosate and evaluating the efficacy, dose and time of application, some studies were conducted in 2011 at Aarhus university of Denmark. At first, the efficacy of sulfosulfuron (0.029, 0.147, 0.735, 3.676 and 18.378 mg per lit) and glyphosate (0.023, 0.117, 0.587, 2.935 and 14.676 µl per lit) on Egyptian broomrape seeds were tested in vitro without a host plant by using of GR24. Then, the efficacy of these herbicides for broomrape control in two varieties of tomato (Viva and Hyb.Petopride II) in greenhouse conditions was investigated. Treatments in greenhouse experiments were four doses of sulfosulfuron (25, 50, 75 and 100 gr ai/ha) and glyphosate (20, 40, 60 and 80 gr ai/ha) at one, two and three application. First application was conducted 15 days after tomato seedlings transplanting and the time between two applications was 14 days. Results of Petri-dish experiment showed that both herbicides significantly reduced radical length of broomrape seeds compared to the untreated control. In pot experiments, two tomato varieties responses to herbicides were different. Viva cultivar was better than Hyb.Petopride II Cultivar in both herbicide applications. Sulfosulfuron at doses of 50 gr ai/ha (one, two and three times of application) and 25 gr ai/ha (two and three times of application) viva cultivar were the best treatments for broomrape control and producing tomato biomass. Also, glyphosate at doses of 20 and 40 gr ai/ha (one, two and three times of application) in this variety was safe for tomato and controlled broomrape. Sulfosulfuron was a safer herbicide than glyphosate for broomrape control in tomato.

Keywords: Chemical control, Parasitic weed, Germination stimulant of GR24

1,2,4- PhD Graduated of Weed Science and Associate Professor, of Agronomy and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively
(*- Corresponding Auteur Email: stokasi@yahoo.com)
3- Professor of Agronomy Department, Tehran University
5- Assistant Professor of University of Apply Science and Technology, Guilan, Rasht
6- Aarhus University, Denmark

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۳

Effect of Arbuscular Mycorrhizal Fungi (*Glomus mosseae* and *Glomus intraradices*) on Different Levels of Population of Root-Knot Nematode (*Meloidogyne javanica)* in Tomato

F. Sohrabi[1]- A.A. Fadaii Tehrani[2]- Y. Rezaee Danesh[3*]

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Abstract

Two fungal species *Glomus mosseae* and *Glomus intraradices* as well as *Meloidogyne javanica* nematode were used in order to evaluate the effects of arbuscular mycorrhizal fungi on control of different populations of root-knot nematode in tomato. A greenhouse test was established as factorial experiment based on completely randomized design with 8 treatments and 4 replicates followed by mycorrhizal fungi propagation as well as nematode identification. Different plant growth indices as well as nematode developmental parameters (gall numbers and egg mass on each plant, egg numbers in each egg mass and J2 numbers in soil) were estimated. Different nematode populations (5000, 10000 and 15000) were used in this experiment. Statistical analysis results showed that the mycorrhizal fungal species used in this study improved the growth of different plant parts and decreased nematode damages. Two fungal species did not have meaningful differences. Also, results showed that the mycorrhizal fungi have a high potential in effective control of root-knot nematode even in high populations.

Keywords: Arbuscular Mycorrhizal Fungi, Root-Knot Nematode, Tomato

1,2- MS.c Student and Assistant Professor, Department of Plant Protection, Faculty of Agriculture, University of Shahrekord
3- Associate Professor, Department of Plant Protection, Faculty of Agriculture, University of Urmia
(* - Corresponding Author Email: yonues_rd@yahoo.com)

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۴

Investigating Efficacy of The Tank Mixture of Nicosulfuron (Cruz) plus Bromoxynil + MCPA (Bromicide MA) for Weed Control in Corn in Jiroft

E. Mamnoie[1]*- M.A. Baghestsni[2]

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Abstract

To investigate the possibility of tank-mix application of two herbicides; Cruz (nicosulfuron 4% SC) and Bromicide MA (bromoxinil+ mcpa 40 % EC) for control of weeds in corn an experiment was carried out in Jiroft and Kahnoj Agricultural Research center during 2009. The experiment was conducted in a factorial experiment based on randomized complete block design with four replications. The first factor was Bromicide MA (bromoxynil + mcpa) at 0, 0.5, 1.0 and 1.5 liters per hectare and the second factor was Cruz (nicosulfuron) with 0, 1.0, 1.5 and 2.0 liters per hectare. Results indicated that the tank mixture of these two mentioned herbicides had a significant effect on the density and dry weight of *Digera muricata*, *Portulaca oleracea*, *Echinochola colonum*, and *Cynodon dactylon*. Not only did they control the mentioned weeds more effectively but also increased corn yield. The most efficient treatment was mixture of Bromicide MA (bromoxynil+mcpa) one liter per hectare plus Cruz (nicosulfuron) at 1.5 liters per hectare which increased corn grain yield by 23%.

Keywords: *Digera muricata*, *Portulaca oleracea*, *Cynodon dactylon*, Chemical control, Yield corn

1- Lecture Researcher, of Agronomy, Agriculture Research Center of Jiroft and Kahnoj
(*- Corresponding Author Email: emamnoie@yahoo.com)
2- Professor Researcher of Weed Research Department, Iranian Plant Protection Research Institute, Tehran

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۵

Inhibitory Effects of Essential Oils of *Allium hirtifolium*, *Salvia officinalis* and *Kelussia odoratissima* on *Meloidogyne javanica* and to Extract of their active Substances

A. Feyzi[1*]- E. Mahdikhani Moghadam[2]- M. Azizi[3]- H. Rouhani[4]

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Abstract

Root-knot nematodes (*Meloidogyne* spp.) are important group of plant pathogens that have extensive hosting range and are caused for significant damage to agricultural products annually. Various management strategies of control on nematodes has been used, but the application of plant products is one of the promising methods for nematode control. In this study, inhibitory effect of essential oils of *Allium hirtifolium*, *Salvia officinalis* and *Kelussia odoratissima* was evaluated in vitro. Gas chromatography coupled with mass spectrometry was applied to identify the main components of the essential oils of *Kelussia odoratissima* and *Salvia officinalis*. The principal constituents of *Kelussia odoratissima* oil consisted of Z-ligustilid (54.11%), (Z)-3-butylidene-phthalide (14.37%) while those of *Salvia officinalis* oil was α-Thujone (32.8%) and 1, 8-Cineole (12.8%).Evaluation of allicin within shallot with HPLC method was 1.5 µg/mg. Second juvenile mortality percent after 24h of exposure extract and egg hatching inhibition percent after 7 days was assessed. Six concentrations of each oil were utilized each in six replications. All plant essences have significantly reduced population of this nematode. Shallot oil in 2000ppm, showed more than 90% mortality of juvenile and more than 30% (toward control) in inhibition egg hatching. Essential oils of *Kelussia* and *Salvia* in 4000 ppm showed more than 50% mortality of juvenile and 30% inhibition egg hatching. The results demonstrated that the essential oils of these plants particularly, oil of shallot can be considered as potential protectants against root-knot nematodes in tomato.

Keywords: Nematicidal effect, Essential oil, *Allium hirtifolium*, *Salvia officinalis*, *Kelussia odoratissima*. root-knot nematode

1,2, 4- MSc Student, Associate Professor and Professor, Department of Plant Protection, College of Agriculture, Ferdowsi University of Mashhad, Respectively
(*- Corresponding Author Email: Alfeyzi1391@chmail.ir)
3- Professor, Department of Horticulture Sciences, College of Agriculture, Ferdowsi University of Mashhad

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Evaluation of Alfalfa (*Medicago sativa* L.) Cultivars Tolerance to Dodder (*Cuscuta campestris* L.)

A. Karimzadeh[1]- S. Maleki Farahani[2]*- F. Meighani[3]- M.H. Fotokian[4]

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Abstract

Weed chemical control has negative results on agroecosystems. Therefore, identification of cultivars tolerant to weeds has importance in nonchemical management. So, in this study, the tolerance of some alfalfa cultivars was studied to dodder. Anexperiment was conducted at research farm and laboratory of Shahed University in 2011. The farm experiment was done as split plot in time in randomized complete block design with three replicates. The treatments were included 12 alfalfa cultivars. The results showed that Local Hamedani and Fao were most sensitive and tolerant cultivars, respectively. Therefore, in laboratorial experiments, the effect of seed aqueous extract of Local Hamedani and Fao cultivars was evaluated on dodder seed germination. The experiment was conducted as factorial in randomized complete block design. The factors were seed extract of tolerant and susceptible cultivars of alfalfa at 5 levels, including zero (distilled water), 25, 50, 75 and 100 percent concentration. The results indicated that the effect of different concentrations of the extract was not significant on dodder seed germination, but the effect of cultivar and interaction of cultivar and concentration were significant on dodder seed germination. Dodder seed germination decreased as Fao seed extract concentration increased while a reverse trend was seen in Local Hamedani cultivar. In general, it seemed that Local Hamedani cultivar has some substances in seed that could stimulate dodder germination however there was not seen such a result in Fao, the tolerant variety. Complementary experiments are decisive to attain accurate results.

Keywords: Alfalfa, Allelopathy, Extract, Polyethylene glycol, Seed

1, 2, 4- M.Sc Student, Of Assistant Professor and Associate Professor, Department of Agronomy and Plant Breeding, College of Agricultural Science, Shahed University, Respectively
(*- Corresponding Author Email: maleki@shahed.ac.ir)
3- Associate Professor, Weed Research Department, Iranian Research Institute of Plant Protection

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۷

Effects of Allelopathic Compounds of Barley *(Hordeum vulgare* L.) on Seed Germination, Seedling Growth and Some Antioxidant Activities of *Chenopodium album* L.

R. Farhoudi[1]- A. Modhej[2*]- S.R. Alavinia[3]

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Abstract

In This study, phytotoxicity of allelochemical barley (*Hordeum vulgare)* extracts on *Chenopodiom album* germination and enzymes activities were bioassay. Allelopathic extracts were a phenolic and three alkaloids compounds (strychnine, atropine and quinine). Experiment was carried out under completely randomized design with three replications. Results indicated that the alkaloids atropine and strychnine had the highest negative impact on germination percentage, germination rate, seeding fresh weight, activities of catalase, proxidase and alpha amylase enzymes. Also, these treatments caused to increase cell membrane's damage and Malondialdehyde (MDA) concentration in the tissue of target weed. The highest concentration of MDA of *Chenopodiom album* was belonged to strychnine treatment with 0.076 nmol.g^{-1} fresh weight of seedling. The highest activity of catalase, proxidas (6.3 and 17.1 mg observed in 60 seconds, respectively) and alpha amylase (9 nmol of seeds per minute) was observed in quinine next to control treatment, suggesting low impact of this alkaloid in purposed plant, compared to other allelochemicals. Generally, barley allelochemical extracts including phenolic, strychnine and atropine compounds had higher negative effects on seed germination and enzymes activities of *Chenopodiom album* seedling.

Keywords: Allelopathy, Alkaloids, Phenol, Alpha amylase, Malondialdehyde, Allelochemicals

1,2,3- Assistant Professors and MSc Student, Department of Weed Science, College of Agriculture, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran, Respectively
(*-Corresponding Auteur Email: adelmodhej2006@yahoo.com)

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۸

Reaction of Desi and Kaboli Chickpea Genotypes to Race 3 and 6 of *Ascochyta rabiei*

H.R. Kavousi[1*] - J. Mozafari[2] – S.H. Marashi[3]- A. Bagheri[4]

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Abstract

The fungal disease, Ascochyta blight, caused by *Ascochyta rabiei* is a major yield limiting factor of chickpea (*Cicer arietinum* L.) in many countries, including Iran. Identification of resistance sources against races or pathotypes of the fungus causing this disease is required for breeding resistant chickpea cultivars. Reaction of six selected genotypes of Iranian chickpea collection was evaluated against race 3 and 6 of the pathogen. The phenotypic evaluation of genotypes for their reactions against race 3 and 6 of the pathogen showed a varying degree of resistance against race 3. Genotypes Kc-218848 and Kc-218740 were identified as relatively resistant, while none of the genotypes were resistant against race 6 of the pathogen. The comparison of trends of disease development against the two races also showed that genotypes were significantly different for their reaction to this disease. The trend of disease development against race 3 was much slower compared to race 6. The cluster analysis of trend of disease development among genotypes during four sequential weeks after inoculation with race 3, divided the genotypes into two distinct groups. Resistant genotypes Kc-218848 and Kc-218740 were classified in one group and genotypes considered relatively susceptible including MCC-496, MCC-54, MCC-311 and MCC-133 were grouped separately in another cluster. These results suggested that development of Ascochyta blight chickpea cultivars for regions dominated by race 3 of *Ascochyta rabiei* is feasible.

Keywords: Chickpea, Germplasm, Disease resistant, *Ascochyta rabiei*

1 - Assistant Professor, Department of Biotechnology, College of Agriculture, Shahid Bahonar University of Kerman, IRAN
(*- Corresponding Author Email: hrkavousi@uk.ac.ir)
2- Associate Professor, National Plant Gene-Bank, Seed and Plant Improvement Institute, Karaj, IRAN
3,4- Associate Professor and Professor, Department of Biotechnology and Plant Breeding, College of Agriculture, Ferdowsi University of Mashhad, Mashhad, IRAN

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۲۹

Identification of Citrus Viroids in Commercial Citrus Varieties by Molecular Techniques

L. Ebrahimi Moghaddam[1]*- S.M. Bani Hashemian[2]- S.A. Elahinia[3]- S.N. Bani Hashemian[4]

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Abstract

In this study, the possible infection of Thomson navel, Moro blood sweet orange, Page mandarin and Webber pomelo with citrus viroids was investigated. Biological indexing was performed by grafting on Etrog citron (*C. medica*) and maintained in temperature-controlled greenhouse. After inoculation, RNA was extracted by SDS– potassium acetate method. Detection of citrus viroids was done Reverse Transcription-Polymerase Chain Reaction (RT-PCR) using specific primers of *Hop Stunt Viroid* (HSVd), *Citrus Bent Leaf Viroid* (CBLVd), *Citrus Dwarfing Viroid* (CDVd) and *Citrus Bark Cracking Viroid* (CBCVd). The results indicate Thomson navel and Moro blood sweet oranges had mix infection to all viroids in this study.

Keywords: RT-PCR, HSVd, CBLVd, CDVd, CVCVd

1- PhD Student of Plant Pathology, College of Agriculture, Ferdowsi University of Mashhad, Iran
(* - Corresponding Author Email: ebrahimimoghaddam@stu.um.ac.ir)
2- Assistant Professor of Virus and Virus Like Disease of Citrus Plant Virology, Iran Citrus Research Institute
3- Professor of Plant Pathology, University of Guilan
4- Graduated MSc of Plant Pathology, Azad University of Varamin, Pishva

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Effect of Fungicides on Germination and Growth of Fungi Associated with Esca Disease of Grapevine in Vitro

A. Rezaie[1]- M.R. Karimi[2*]- M. Hashemi[3]- N. Ghezelseflo[4]- V. Dehvari[5]

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Abstract

Esca of grapevine is a serious and injurious disease in grape-growing all over the world, for which no effective control exists. The presented research ,in two separate experiments ,thirteen fungicides (benomyl, thiophanate-methyl thiram, mancozeb, fosetyl-Al, metalaxyl mancozeb, caboxin thiram, ortiva, topas, penconazole , tebuconazole ,propiconazole, sodium arsenate, agri-fos) were evaluated for their in vitro effects on conidial germination and mycelia growth of *Phaeoacremonium iranianum*(*Phi*), *Phaeomoniella chlamydospora* (*Pch*) and *Fomoitiporia mediterranea* (*Fmed*) , the most causal agents of esca diseases of grapevine in north Khorassan province. Those experiments were tested in a completely randomized design with factorial arrangement and three replications. For each fungicides eight concentrations (0,0.1,0.2,1,2,3,10,100) were assessed. The different fungicides were added to MEA in order to achieve the experimental concentrations. Mycelial plugs of each pathogen were transferred to the center of the fungicide amended plates. After 10 days, the daily growth rate relative to the unamended control was estimated. The results showed that sodium arsenate was found to be the most effective fungicide in inhibiting the colony growth of three associated fungi of esca followed by carboxin thiram and benomyl against *Fmed* and two other pathogens respectively. Meanwhile Agri-fos and ortiva were less effective. Additionally, Conidial suspensions ($5x10^5$ conidia ml^{-1}) of both pathogens *Pch* and *Phi* were exposed to 3ppm concentration of the different fungicides. After 24 hours, the percent conidia germination relative to the control treatment was assessed. Sodium arsenate(87.51%) and thiophanate-methyle thiram (85.93%) were highly effective on suppression spore germination. Meanwhile Agri-fos (20.55%) showed less performance in reducing spore germination of two pathogens.

Keywords: Fungicides, Esca, Grapevine

1,4- MSc Students of Damghan Islamic Azad University, Damghan, Iran
2- Assistant Professor of Khorassan Razavi Agricultural and Natural Resources Research Center, Mashhad
(* - Corresponding Author Email: Karimi_in@yahoo.com)
3- Assistant professor of Seed and Plant Improvement Institute, Karaj, Iran
5-MSc Student of Biotechnology of Tehran Payamenour University

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جلد ۲۸، شماره ۲، تابستان ۱۳۹۳، ص. ۳۱

Brief Report
First Report of Detection on *Cucumber green mottle mosaic virus* (CGMMV) by Serological and Molecular Methods in Razavi and Northern Khorasan Provinces

Z. Moradi[1*]- B. Jafarpour[2]- M.A. Sabokkhiz [3]

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Abstract

Virus infections are a major limiting factor in cucurbit production in Iran. *Cucumber green mottle mosaic virus* (CGMMV) infects many cucurbit species in the world and causing mottle and systemic mosaic symptoms on cucurbitaceous plant leaves. During 2008-2009, from different Cucurbitaceous species fields and cucumber greenhouses in Razavi and Northern Khorasan provinces, 220 leaf samples with CGMMV-like symptoms were collected and brought to the laboratory under standard condition. The identity of virus was established by the studying host rang symptoms and serological assay. By using DAS-ELISA technique 47 samples showed infection with CGMMV. Sap of infected samples inoculated on a number of indicator plants and presence of CGMMV was confirmed by observation of specific symptoms and DAS-ELISA results. To confirm the results of ELISA test, total RNA was extracted using RNX^{TM}(-Plus) solution and synthesis of cDNA followed by Touch-down PCR using specific primer for amplification of coat protein gene. PCR product was electrophoresed in a 1.7% agarose gel in TBE buffer and the band of 420 bp related to CGMMV was detected .This is the first report of occurrence of CGMMV in different regions of Razavi and Northern Khorasan provinces.

Keywords: Cucumber *green mottle mosaic virus* (CGMMV), DAS-ELISA, RT-PCR, Razavi and Northern Khorasan provinces.

1, 2, 3- MSc. Student, Professor and Lecture of Plant Pathology Department, College of Agriculture, Ferdowsi University of Mashhad, Respectively
(*- Corresponding Author Email: zohrehmoradi2008@yahoo.com)

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Brief Report
First record of Three Cecidomyiid Gall Midges (Dipteral: Cecidomyiidae) from Iran

M. Joghataie[1]- H. Sadeghi Namaghi[2*]- M. Hosseini[3]

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Abstract

In a faunistic survey of Cecidomyiid gall midges (Diptera: Cecidomyiidae) in Isfraeen, Joghatai, and Jovein regions (North Khorasan province) in 2012, three species, *Clinodiplosis cilicrus* Kiefer 1889, *Asphondylia anatolica* Skuhrava1998 and *Lasioptera carophila* Low 1874 were collected and identified from galls on *Cirsium arvense* (L.), *Astragalus* sp. and *Dacus carota* L. respectively. These three species are being reported for the first time from Iran.

Keywords: Diptera, Fauna, Gall midges, Plant galls

1,2,3- MSc Student, Associate Professor and Assistant Professor, Department of Plant Protection, Faculty of Agriculture, Ferdowsi University of Mashad, Respectively
(*-Corresponding Author Email: sadeghin@um.ac.ir)

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Brief Report
Study Relationship Between Temperature and Developmental Rate of Two-Spotted Spider Mite, *Tetranychus turkestani* (Acari :Tetranychidae) Using the Temperature Models

Z. Saeidi[1]* - A. Nemati[2]

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Abstract

Arthropod development is affected by temperature. Knowledge of relationship between temperature and mite developmental rates is useful in biological and ecological studies. Effect of six constant temperatures (15, 20, 25, 30, 35, 40 $^{\circ}C$) on developmental rate of all stages of two-spotted spider mite, *Tetranychus turkestani* Ugarov & Nicolski, were investigated under laboratory conditions at $55 \pm 10\%$ R.H and a photoperiod of 16:8 L:D and developmental rate of the mite modeled as a function of temperature. The performance of one linear and 11 nonlinear developmental rate models (Logan–6, Logan–10, Sharp and DeMichele, Taylor, Lamb-1, Lamb-2, Hilbert and Logan, Briere–1, Briere–2, Lactine–1 and Lactine–2) were compared and based on the criteria such as adjusted coefficient of determination (R^2), the residual sum of squares (SSR) and estimation of biological parameters the best model was selected. The results indicated that the Briere–2 model (R^2= 0.996 , SSR = 0.00022) was the best model for description of the mite biological parameters.

Keywords: Biological parameters, Optimum temperature, Two-spotted spider mite, Threshold temperature

1- Assistant Professor, Department of Plant Protection, Agricultural and Natural Resources Research Center, Chaharmahal and Bakhtiari Province, IRAN
(*-Corresponding Author Email: zarirsaeidi@yahoo.com)
2- Assistant Professor, Department of Plant Protection, Agricultural College, Shahre- kord University, IRAN

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Brief Report
Report of *Protaphelinus nikolskajae* (Yasnosh, 1963) (Chalcidoidea: Aphelinidae), a Parasitoid of The Popular Aphid, *Pemphigus immune* from Iran

G. Hasanshahi[1]- F. Jahan[2]- H. Abbasipour[3]- G. Japoshvili[4]

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Abstract

In order to identify *parasitoids of poplar aphid*, sampling was done at urban areas of Tehran in 2011. Aphid galls were put in clear plastic containers and were evaluated until emergence of parasitoids on daily basis. Among the samples, a new species namely *Protaphelinus nikolskajae* (Yasnosh, 1963) (Chalcidoidea: Aphelinidae) was identified. This species is a parasitoid of the popular aphid, *Pemphigus immunis* that is a new record for fauna of Iran.

Keywords: Iran, Pemphigus immune, Parasitoid, Protaphelinus nikolskajae

1,2- M.Sc Student of Entomology, Plant Protection Department, College of Agricultural Sciences, Shahed University, Tehran
(* - Corresponding Author Email: Hasanshahi.entomo@yahoo.com)
3- Associate Professor of Plant Protection Department, College of Agricultural Sciences, Shahed University, Tehran
4- Assistant Professor, Entomology and Biocontrol Research Centre, Agricultural University of Georgia