



Application of Some Plant Products to Control of *Fusarium Oxysporum* F.Sp Cumini Causing Cumin Wilt

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Abstract

Some plant species were tested for their antifungal effect on radial growth and spore germination of *Fusarium oxysporum* f.sp cumini causing cumin wilt. In this experiment cold water extracts and methanol extract of various plants were prepared and their efficacy was tested against the pathogens by using of filter paper method, poisoned food technique and steams of extracts. Influence of plant extracts on cumin wilt disease also evaluated by Invivo tests. Seed extracts of *Trachyspermum copticum*, leaf extracts of *Lavandula angustifolia* and flower extracts of *Rheum ribes* effectively inhibited the radial growth and spore germination of This fungus by using of filter paper and poisoned food methods. Steams of extracts of *T.Copticum* and *Mentha pulegium* effectively inhibited the radial growth of the pathogen. The invivo tests indicated that these extracts reduce disease incidence of cumin wilt.

Keywords: Antifungal effect, Cold water extract, Methanol extract, Cumin wilt

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Biological Control of Field Bindweed (*Convolvulus Arvensis*) by Using Plant Antagonistic Fungi

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Abstract

Field bindweed is an important perinial weed of agricultural crops word-wide which causes many problems in varous crops. A series of studies were carried out in Faculty of Agriculture, Ferdowsi University of Mashhad, and Natural Research Center of Lorestan in order to find the most suitable antagonist for biocontrol of field-bindweed during 2006-2007. Contaminated field bindweed's were collected from Khorramabad and Mashhad gardens and fields. Pathogenes were isolated, cultured and piurified in laboratory, then their pathogenesis effect were compared on field bindweed. Results showed that *Alternaria alternata* isolate A2 developed the most infection. Plants at 4-leaf stage showed the most susceptibility to this pathogen. Among different spore concentrations (10^4 , 10^5 , 10^6 and 10^7 spores per ml distilled water) the treatment of 10^7 spores per ml at 4-leaf stage caused maximum weed control in field bindweed. The most senetive field bindweed growth stage to *A. alternata* was at stage of 2-4 foliage. Results of this researched that *A. alternata* has a high potential in biocontrol of field bindweed and ther dore more invastigations are recommended.

Keywords: *Altenaria alternata*, Bioherbicide, Growth stage, Non-chemical control, Spore concentration

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Investigation of resistance of plum, peach and nectarine cultivars to foliar stone fruit rust

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Abstract

In the recent years, stone fruit trees rust will progress in a large area of stone fruit garden in Golestan province. This disease is a major disease of these plants in Golestan province and the tropical climates with high rainfall. The experiment evaluated for resistance of peach cultivars (shast roze, makhmali, zaferani), plum cultivars (santeroza, ghatretala, shablon), and nectarin cultivars (redgold, sibi, kiuta, moghan) in the Azadshahr collection of stone fruit tree. We selected randomly samples include twenty five on the four different sides of ten trees. We scored samples basis to present or absent infection. The results showed that there are significant differences between all cultivars. On the plum cultivars ghatretala and santeroza showed high susceptible and shablon was resistant. On the peach cultivars shastroze was susceptible and there is not significant difference between makhmali and zaferani and both cultivars showed moderates resistance to disease. In the nectarin cultivars moghan was resistant and redgold, sibi and kiuta were high with susceptible respectively. There are not significant differences between these three cultivars. While the chemical toxins for control of plant disease were dangers for the people, application of the resistant cultivars in the disease management is very benefit.

Keywords: Susceptibility, Redgold nectarine, Zaferani peach, Shast roze peach, Shablon plum

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Pathogenicity of Three *Pythium* Species Isolates on Turfgrasses in Tehran Province

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Abstract

To study the role of *Pythium* species as the turf seed and root rot and damping-off agents, during the years 2005 and 2006, diseased samples and soil samples from green spaces and sport fields were collected from different regions of Tehran province. After identification of *Pythium* species, a few of them were selected. Pathogenicity of 5 isolates of *Pythium aphanidermatum*, 2 isolates of *Pythium catenulatum* and 2 isolates of *Pythium okanoganense* was determined under greenhouse condition using artificially infested soil with vermiculite inoculum on common species of turfgrasses (*Lolium*, *Poa* and *Festuca*) in a two factor Randomized Complete Block design. Comparative pathogenicity of *Pythium* species (total of seed rot, root rot and damping-off) on turfgrasses showed that *P. aphanidermatum* was the most virulent species and *P. catenulatum* and *P. okanoganense* were in second and third levels respectively. Also on a scale of 0- 100% *P. aphanidermatum* caused severe seed rot, and *P. catenulatum* and *P. okanoganense* caused moderate seed rot. Based on damping-off and root rot results, all of them were low pathogenic.

Keywords: *Pythium*, Root rot, Seed rot, Damping off, Turfgrass

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Evaluation of Ethion Insecticide Residue in Greenhouse Cucumber and Its Reduction with Different Treatment

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Abstract

High pesticides used in agriculture activity, resulted to presence of pesticide residue in agriculture crops. Ethion insecticide widely used to control various insect pests on greenhouse cucumbers. This study was to investigate the dissipation and different treatment effect on ethion residues decrease at different time intervals in 14 days. The samples were collected from two greenhouses in Mahmud Abad (Mazandaran province, Iran). The samples extracted after transporting to lab. Everyday, 3 samples extracted as control, 3 samples with washing treatment, 3 samples with peeling treatment and 3 samples with refrigeration storage at 4 °C for 48h were prepared. Ethion residue concentrations were determined by gas chromatography (GC). The results showed that maximum concentration of ethion residue detected as 2.50 and 1.83 mg/kg in the first and second day after ethion application, respectively and this trend decreased till the end of 14 days. Up to 7 days after poisoning, ethion residue concentration was higher than Codex standard. The results showed that peeling, washing and refrigeration storage were effective in reducing the ethion residue levels of cucumbers. A waiting period of 7 days after ethion application is suggested for safe consumption of cucumber to decreasing of ethion residues than Codex acceptable limit.

Keywords: Pesticide residue, Ethion insecticide, MRL, Greenhouse cucumber and Codex standard

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Control of Grey Mould and Induction of Defense Responses in Apple Fruit by *Saccharomyces cerevisiae*

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Abstract

The biocontrol activity of *Saccharomyces cerevisiae* against grey mould of apple fruit caused by *Botrytis mali* and its ability to induce biochemical defense responses in apple tissue were investigated. *In vitro* conditions, inhibition of growth of pathogen in dual culture was 24% and in volatile metabolites test was 56%. *In vivo* experiments apple fruit wounds were inoculated with 50µL yeast suspension (10^7 spores/ml) followed 4 h later by 20 µL of conidial suspension of *B. mali* (10^5 spores/ml). The apples were then incubated at 20°C for 8 days. Lesion diameters were evaluated 4 and 8 days after pathogen inoculation. *S. cerevisiae* reduced decay by 74/7% after 8 days. In addition to controlling grey mould, *S. cerevisiae* caused increases in peroxidase activities that showed maximum levels 2 days after pathogen inoculation. This isolate increased catalase activities 2 days and decreased 4 days after pathogen inoculation. Phenolic accumulation was increased in apple fruit treated with antagonist and inoculated with *B. mali* and exhibited the highest level 6 days after treatment. Based on the results of this study, mechanism of *S. cerevisiae* in controlling grey mold was probably production of antibiotic metabolites and induction of resistance.

Keywords: *Botrytis mali*, *Malus domestica*, Phenolic compounds, Peroxidase, Postharvest disease

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Isolation of root-knot nematode, *Meloidogyne cruciani* in cucumber greenhouses of Jiroft and assessment genetic diversity of its population using RAPD-PCR marker

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Abstract

In order to identify the root-knot nematodes in cucumber greenhouses of Jiroft region, during 2007-2008 years, 35 soil and infected root samples were collected from 10 greenhouse cucumbers concerned 3 areas. Extraction of male performed from soil samples and female, second stage juvenile and multiplication in greenhouse performed from infected roots. Two species of *Meloidogyne javanica* and *Meloidogyne cruciani* were identified using morphological and morphometrical characteristics of second stage juvenile, males and perineal pattern of females. In order to investigate genetic diversity of *M. cruciani*, purification and multiplication of each population of current species were performed on susceptible tomato (Rutgers cultivar). Eggs and second stage juveniles were isolated from each root and supposed one population. Total DNA was extracted from eggs-mass of all population by Silva *et al.* (2000) method. Then, RAPD-PCR method was performed using 10 random primers and Bioneer's Accupower™ PCR PreMixes. After amplification, PCR-products were separated electrophoretically on 1.5% gel. DNA bands were scored as 1 (presence band) or 0 (absence band) in Excel and NTSYS software by method of UPGMA and dendrograms were constructed based on cluster analysis. RAPD profiles showed variability between different populations in 3 areas. The clustering at the 72 % disagreement level revealed two groups. Based on the global result, RAPD marker was shown 71-91% similarity and 8-29% differential between population of *Meloidogyne cruciani*.

Keywords: Genetic diversity, *Meloidogyne cruciani*, Cucumber, RAPD-PCR, Jiroft

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Effect of C and N Source on the Growth and Antifungal Activity of *Bacillus subtilis* BS Against *Pythium aphanidermatum*

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Abstract

The source of carbon and nitrogen in culture media affect considerably the growth rate and antifungal activity of antagonistic microorganisms. For this purpose, the effect of 40 liquid culture media containing different sources of C and N, were studied on the growth rate and on the antifungal activity of *Bacillus subtilis* BS on *Pythium aphanidermatum*. The Source of C and N were: glucose, molasses, starch, peptone, extract of: yeast, soy meal, potato, rice and wheat shell. The growth rate of isolate was determined after 48h with the hemacytometer. The antifungal activity of culture media (containing bacteria and metabolites) was evaluated on the colony diameter of *P. aphanidermatum* on 2% water agar in comparison with control (no containing the bacteria) The experiment was perfected in completely randomized design with 40 treatments and 3 replicates. The results showed that the growth rate of bacteria in different culture media were significantly different ($P \geq 1\%$). Among those, the potato-soybean (PSB) and potato-soybean+MnSo₄ (PSBZ) media with 2.46×10^9 and 2.27×10^9 bacteria/ml respectively were determined as the best culture media. The same culture media showed also the more effective antifungal activity, they reduced the colony diameter of *P. aphanidermatum* at the rate of 90.74 and 82.59% relative to control respectively. It can be resulted that the culture media: potato-soybean with and without MnSo₄ are the most favorable media for the both: growth rate and antifungal activity of *B. subtilis* BS against *P. aphanidermatum*.

Keywords: *Bacillus subtilis*, *Pythium aphanidermatum*, Antifungal activity, Biological control, Carbon & nitrogen Sources, Culture media.

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Evaluation of Nematicidal Effect of Essential Oils From Some Medicinal Plants (Apiaceae) Against The Root-Knot Nematode *Meloidogyne Javanica* in Laboratory Condition

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Abstract

In this study, inhibitory effects of essential oils from four medicinal plants in the family Apiaceae including black cumin (*Bunium persicum*), green cumin (*Cuminum cyminum*), ajwain (*Carum copticum*) and fennel (*Foeniculum vulgare*) on hatching eggs and second stage juveniles mortality of root knot nematode *Meloidogyne javanica* were evaluated. The percentage mortality of second stage juveniles and the inhibition of eggs hatching were assessed after exposure to essential oils of plants for 24 hours and 14 days respectively. Results indicated that, there were significant difference among treatments ($P \leq 0.05$). The maximum mortality of second stage juveniles was related to the essential oil of fennel at 2000 ppm. So, the effect of essential oil of black cumin at 2000ppm caused egg hatching inhibition around 92.32%. Also essential oil of fennel at 2000 ppm resulted in 98.3% juveniles' mortality. The results of probit analysis indicated that, the essential oils of ajwain ($LC_{50}=311$ ppm) and fennel ($LC_{50}=773$ ppm) had the highest toxicity against eggs and second stage juveniles of root-knot nematodes, respectively.

Keywords: Essential oil, Medicinal plant, Apiaceae, Control, Root-knot nematode, *Meloidogyne javanica*

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Some Nematodes Associated with Fruit Trees (Orchards) in Moghan Region

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Abstract

In order to identify the nematodes associated with fruit trees in Moghan region (orchards), 120 soil and root samples were collected from several orchards in the region during 2004 and 2005. The samples were washed and the nematodes were extracted by centrifugal flotation technique. Then they were fixed and transferred to glycerin according to the De Grisse method (1966). The permanent slides were prepared from the extracted nematodes. After microscopic consideration, the useful measurement and drawings (morphological and morphometrical characters) were made. In this survey, 28 species belonging to 19 genus, were identified as follows: *Aphelenchoides limberi*, *A. cyrtus*, *Aphelenchus avenae*, *Aprutides guidettii*, *Basiria flandriensis*, *Boleodorus thylactus*, *Coslenchus pycnocephalus*, *Criconemoides xenoplex*, *Criconema informis*, *Ditylenchus kheirii*, *D. medicaginis*, *D. parvus*, *Filenchus afghanicus*, *F. vulgaris*, *Merlinius rugosus*, *Helicotylenchus pseudorobustus*, *Paraphelenchus acontioides*, *Paratylenchus tateae*, *P. nanus*, *Pratylenchus neglectus*, *P. thornei*, *P. vulnus*, *Psilenchus hilarulus*, *Rotylenchus cypriensis*, *Zygotylenchus guevarai*, *Longidorus iranicus*, *L. profundorum*, *Xiphinema index*. Three species viz: *Aphelenchoides cyrtus* and *Paraphelenchus acontioides* are reported here for the first time from Iran. *Paraphelenchus acontioides* is separated from the similar species with eight lateral fields and terminal spike or mucro of tail. *Aphelenchoides cyrtus* is separated from the similar species with four lateral fields, constriction in lip region, number and shape of mucro, length of body and male nematodes.

Keywords: Nematode, Fruit trees, Fauna, Moghan, Iran, Tylenchida, Longidoridae

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Estimating cardinal temperatures and effect of different levels of temperature on germination indices of purslane (*Portulaca oleracea* L.)

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Abstract

In order to study seed germination responses of purslane (*Portulaca oleracea* L.) to temperature regimes, an experiment was carried out in a completely randomized design with five replications and seventeen levels of temperature (0, 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 35, 37, 40, 45, 50, 51 °C). The results showed that increasing temperature significantly increased percentage and rate of germination, also length and dry weight of radicle and plumule, ratio of root to shoot length and seedling vigor index while decreased the mean germination time. Highest germination properties observed in the range of 10-40 °C and lowest germination occurred at 5 °C. Highest germination rate was in 35 degree but there was not significant different in the range of 20-40 degree treatment. Therefore, base temperature for purslane germination estimated at 5, optimum temperature in range of 10-40 and maximum temperature equal to 50 °C, respectively. This extended temperature range for germination and the ability to germinate rapidly suggest the high potential of purslane to establish in most arid and semi arid areas of Iran as a weed, vegetable as well as medicinal plant.

Keywords: Germination, purslane, temperature.

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A Survey on Proteases and α -Amylase of the Oocyte and Egg of the Pistachio Green Stink Bug, *Brachynema Germari* Kol. (Hemiptera: Pentatomidae)

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Abstract

The pistachio green stink bug (*Brachynema germari* kol.) is one of the most important pests of pistachio in Iran which causes considerable damage to this valuable crop annually. For controlling insect pests such as *B. germari*, their physiological process have been considered to be interfered. Using common conventional substrate; hemoglobin, Maximum total proteolytic activity was measured at pH 3 suggesting the presence of cysteine proteinases in the egg and oocyte extract. The specific substrates for cysteine proteases, Z-Arg-Arg-pNA, Z-Phe-Arg-pNA, were hydrolyzed by egg and oocyte extract strongly suggesting the presence of the cysteine proteinases cathepsin B and cathepsin L, respectively. Hydrolyzing activity of the cathepsin B and L in egg extract against the substrates Z-Phe-Arg-pNA and Z-Arg-Arg-pNA was inhibited by the specific inhibitor E-64 up to 99.85% and 82.14% and in oocyte extract 63/24 and 74/62 respectively. The presence of cysteine proteases was supported by enhancement of the egg proteinase activity in the present of 1mM DTT and oocyte proteinase activity in the present of 1mM L-cysteine for Z-Phe-Arg-pNA and for Z-Arg-Arg-pNA, 99.41, 78.57 and 188.23, 27.71 respectively. In general, the results revealed the presence of cothepsin L and B proteinases in egg and oocyte extract. Also α - amylase presence in egg and oocyte of green stink bug was determined and the enzyme optimum pH was 6.

Keywords: Pistachio, *Brachynema germari*, Cysteine proteinases, Cathepsin L, Cathepsin B, α - amylase

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Effect of Crop Rotation on Wild Barley Control in Wheat Fields of Fars Province

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Abstract

An experiment was carried out during four years (2002 – 2006) with eight treatments and four replications to evaluate the effect of crop rotation on wild barley control under Randomize Complete Block Design in Fars Agri. Research Station. Treatments included: 1) Wheat-wheat-wheat- wheat. 2) Wheat-fallow- maize (no herbicide)-wheat. 3) Wheat-fallow-maize (with herbicide)-wheat. 4) Wheat-fallow-sugarbeet (no herbicide)-wheat. 5) Wheat-fallow-sugarbeet (with herbicide) -wheat. 6) Wheat-fallow-sunflower (no herbicide)-wheat. 7) Wheat-fallow-sunflower (with herbicide)-wheat. 8) Wheat-canola (with grass killer)-canola (grass killer)-wheat. Results indicated that in treatment-1, seed bank density in the forth year showed an increasing trend in comparison with the first year. Treatments 4,3,6,2,5 had lower weed seed bank density in fourth year, respectively. Analysis of variance of factors such as wheat length and yield, EWRS and wild barley seedlings number indicated that treatment-1 had significant difference at 0/05 with the rest of treatments, except for the treatment-8. It was between treatment-1 and the others. Treatment 4,7,3,6,2 and 5 ranked first class. The rotational treatments included sugar beet, sunflower and maize were effective on weed seed bank depletion and decreasing weed density, respectively. There were not significant differences between treatments with and without herbicide. Wheat yield data showed that herbicide with residual effects like Atrazine and Alachlor in Maize or Trifluralin in sunflower had side effect on wheat, while those without residual effects like Desmedipham in sugar beet didn't affect wheat yield.

Keywords: *Hordeum spontaneum*, Maize, Rotation, Sugar beet, Sunflower, Weed, Wheat



Effects of Salt (NaCl) and Drought (PEG₆₀₀₀) Stresses on Germination Characteristic and Seedling Growth of Barnyard Grass (*Echinochloa Crus-Galli* Var:*Oryzicola*)

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Abstract

Salt and drought stress are two major environmental stress in Iran that affect growth and development of plants. In order to study effects of salt and drought stress (NaCl and PEG₆₀₀₀) on germination characteristic and seedling growth of Barnyard grass two separate experiment were conducted in growth chamber, at research laboratory of college of agriculture, University of Birjand during 2008. The Experimental design was a completely randomized design (CRD) with four replications. Treatments were salt and drought stress as osmotic and matric potential, respectively, at four levels (0, -0.3, -5, -10 and -15 bars). The Result showed that when stress increased, germination percent, germination rate, root and stem length, root, seedling and stem fresh weight decreased significantly ($p \leq 0.05$), this were higher in drought stress than salt stress. Results showed that reduction percentage for root length was higher than the plumul lenght. When water potential decreased, time to 50% of maximum germination increased. The functional three-parameter logistic model provided a successful estimation of the relationship between salt and drought stress levels and germination response of Barnyard grass. This model showed that salinity and drought at -7.34 and -0.5012 bar, respectively caused 50% reduction in maximum germination percentage of Barnyard grass. The effect of recovery on ungerminated seeds that record in -10 and -15 bars osmotic potential salt showed, it may the reduce or no germination of Barnyard grass resulting in reduce water potential.

Keywords: Germination, Osmotic Potential, Biology, Weed, Recovery



Brief report

Study on Fungal Agents Causing Shot Hole Disease on Stone Fruit Trees in Razavi Khorasan Province

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Abstract

During a survey on shot hole disease of stone fruit in Razavi Khorasan Province in 2006-2007, the fungi *Wilsonomyces*, *Ulocladium*, *Alternaria*, *Curvularia*, *Fusarium*, *Nigrospora*, *Drechslera*, *Penicillium*, *Stemphylium* and *Cladosporium* were isolated from infected leaves and twigs of Peach, Apricot, Almond, Cherry, Sour Cherry and Prune on PDA, MEA and WA media. The fungi which had more frequency in the isolations were purified and inoculated on leaves in laboratory and *in situ*. The results revealed that *A. alternata* (Fr.) Keissler, *W. carpophilus* (Lev.) Adaskaveg, Ogawa & Butler and *Ulocladium atrum* Preuss; were more important causal agents of shot hole respectively in Razavi Khorasan Province.

Keywords: Shot-hole disease, Stone fruits, Causal agents of disease, Razavi Khorasan Province

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Brief report

Evaluation of Damask Rose Genotypes for Powdery Mildew Resistance

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Abstract

Rose Powdery mildew is one of the most common diseases that attacks both garden and greenhouse roses world wide. It is also an important disease of *Rosa damascena* in Iran. Since Iran appears to be a center of genetic diversity for Damask rose, finding powdery mildew resistance genes is expected. Therefore, a set of Damask roses from diverse regions of Iran were screened for powdery mildew resistance. The plants were screened for natural infection over two years (2006 and 2007) both in the field and in pots. The diseases index and factor were calculated for each genotype and severity of disease was compared at different scoring times. Screening in the field was not consistent, probably due to non uniform pathogen distribution, but potted plants that were placed in favorable environmental conditions (half-shade with relatively high humidity) gave consistent ratings over replications. Significant differences in the rate of powdery mildew development were found between genotypes. The East Azerbaijan and Kerman genotypes were recognized as the most resistant and susceptible genotypes respectively. Results are promising for planning the future breeding programs on this valuable species.

Key words: *Rosa damascena*, Powdery mildew, Screening, Disease resistance

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