PR Verma M. Sc. Students Award, 2012

Biochemical Changes and Ecofriendly Management of Fusarium Fruit Rot of Banana

B Singh Khushbu and RK Patil

Department of Plant Pathology, B. A. College of Agriculture, Anand Agricultural University, Anand – 388 110, Gujarat, India. Email: singh.khushbu22@gmail.com

Abstract

Investigation was done to understand the biochemical changes and develop ecofriendly management practices for Fusarium fruit rot of banana caused by *Fusarium moniliforme*. The activities of polygalaturonase (PG), polymethylgalacturonase (PMG) and cellulolytic enzymes (CX) were studied in ripe and semi ripe fruits inoculated with *F. moniliforme* along with healthy fruit. The enzymatic activities were higher in ripe fruits, PG (41.6%), PMG (38.9%) and CX (32.7%) than in semi ripe ones (33.7, 17.7 and 13.7%), respectively. Total soluble sugars of banana decreased by 11.2%, followed by 11.3 and 11.5% on 6th, 5th and 4th d after inoculation compared to control fruit (18.0%), while total phenol increased by 2.4% followed by 2.7 and 2.7% on 6th, 5th and 4th d of inoculation, respectively, in inoculated banana fruits as compared to control (2.4%). Of the nine phytoextracts (10% conc) screened for their efficacy in vitro and in vivo, cinnamon extract proved most effective in inhibiting mycelia growth and reducing the Fusarium fruit rot severity both in pre- (14.2%) and post-inoculation (13.3%) treatments and it was at par with garlic, piper, arduisi and neem leaf extracts. Of the five homeopathic medicines (200 potency) tested against the mycelial growth of *F. moniliforme*, Methyl jasmonate was found most effective in inhibiting the mycelial growth and it proved most effective in reducing the Fusarium fruit rot severity both in pre- (11.5%) and post-inoculation (11.0%) treatments, followed by benzothiadiazole. Among nine oils (5%) tested, significantly lower Fusarium rot severity was recorded in fruits coated with castor oil (13.3 and 12.7%), followed by neem oil both in pre- and post-inoculation treatments, respectively.

Key words: Banana, cellulotic enzymes, Fusarium fruit rot, homeopathic medicines, PG, PMG, phenol, phytoextracts, oils, total soluble sugar

Comparative Effect of Root-knot Nematodes on Seedling Growth, Nematode Penetration and Multiplication in Susceptible and Resistant Bidi Tobacco

Aarti Bairwa and H R Patel

Bidi Tobacco Research Station, Anand Agricultural University, Anand 388 110, Gujarat, India. E.mail: avaartiverma20@gmail.com

Abstract

Root-knot nematodes (Meloidogyne incognita and M. javanica) are serious problems of bidi tobacco (Nicotiana tabacum) in light soils of Gujarat. Bidi tobacco varieties Anand 119 (A119) and Anand bidi tobacco 10 (ABT10) are reported as highly susceptible and resistant, respectively to root-knot nematodes. We investigated the comparative effect of root-knot nematode inoculation (5000 J pot⁻¹) on seedling growth, nematode penetration and multiplication on seedlings of a known resistant (ABT 10) and two known susceptible (A119 and GT5) varieties of bidi tobacco. Results revealed that ABT 10 was highly resistant to root-knot nematodes, M. incognita and M. javanica while A 119 and GT 5 were susceptible on the basis of seedling growth, number of transplants established, nematode penetration, infection and multiplication.

Key Words: Host plant resistance, Nicotiana tabacum, root-knot nematodes, seedling growth

Bioefficacy, Phytotoxicity and Residue Analysis of a Systemic Fungicide Azoxystrobin 23SC against Downy Mildew of Grapevine caused by *Plasmopara viticola*

S Archana, K Prabakar and T Raguchander

Department of Plant Pathology, Centre for Plant Protection Studies, Tamil Nadu Agricultural University, Coimbatore-641003, Tamil Nadu, India. Email: archanas_agri@yahoo.co.in

Abstract

Downy mildew of grapevine (*Vitis vinifera*) caused by *Plasmopara viticola* is a widespread and economically important disease worldwide. In this study, six fungicide comprising of systemic and nonsystemic at different concentrations were tested for their bioefficacy against *P. viticola in vitro*, in glasshouse and field experiments. Of these, a new systemic fungicide azoxystrobin 23 SC completely inhibited the sporangial germination at 300µg l⁻¹ onwards. In glasshouse and field experiments azoxystrobin 23 SC effectively checked the progression of the downy mildew. Spraying azoxystrobin 23 SC at 125g a.i.ha⁻¹ provided optimum control of the disease besides increasing the yield. No phytotoxicity occurred at different concentrations of azoxystrobin tested in the field. The initial deposits of azoxystrobin 23SC residues increased with increase in concentration. The residue level reached below detectable level 5d after spraying. The half life values of azoxystrobin 23 SC applied as foliar treatment at 125, 250 and 500g a.i.ha⁻¹ were 1.460, 1.648 and 2.964 days, respectively. Considering the maximum permissible residue limits, the suggested waiting period after spraying was one day.

Keywords: Azoxystrobin 23 SC, bioefficacy, grapevine, *Plasmopara viticola*, residue analysis, phytotoxicity

Additions to Zasmidium species from Indian sub-continent

Archana Singh and RN Kharwar

Center of Advanced Study in Botany, Banaras Hindu University, Varanasi- 221005, Uttar Pradesh, India.
E-mail: drarchanabhu@gmail.com

Abstract

Description and illustrations are provided for three new species of Zasmidium viz, Z. cordiae sp. nov. on living leaves of Cordia crenata Forsk. F. (Boraginaceae), Z. grewiiicola sp. nov. on living leaves of Grewia asiatica Linn. (Tiliaceae) and Z. hyptiantherigena sp. nov. on living leaves of Hyptianthera stricta W.A. (Rubiaceae) that were collected from tarai forest of India and Nepal during 1993-96.

Key words: Hyphomycetes, morphotaxonomy, taxa, Zasmidium

Pseudomonas fluorescens and Arbuscular Mycorrhizal Fungi Promote Tolerance in Black Henbane against Meloidogyne incognita Infection

Arun K Mishra, Sudeep Tiwari and Rakesh Pandey

Microbial Technology and Nematology, CSIR-Central Institute of Medicinal and Aromatic Plants, P.O. CIMAP, Lucknow – 226015, Uttar Pradesh India. E-mail: r.pandey@cimap.res.in

Abstract

Effect of Pseudomonas fluorescens, Glomus intraradices, G. fasciculatum, G. mosseae was evaluated singly and jointly on the reproduction and infection potential of root-knot nematode, Meloidogyne incognita (Kofoid and White) Chitwood causing root-knot diseases of black henbane (Hyoscyamus niger) under glasshouse condition. Among the different treatments evaluated, AM fungi alone and in combination with P. fluorescens showed maximum fresh and dry biomass of H. niger as compared to untreated-uninoculated and untreated-inoculated control. Application of AM fungi and P. fluorescens reduced the population of M. incognita to a varied extent. The root colonization by AM fungi was higher in non inoculated treatments as compared to M. incognita inoculated plants. However, combined treatment also yielded higher root colonization by AM fungi. Although carbofuran showed a significant effect on suppression of M. incognita multiplication, it can be replaced to some extent by bioinoculants as shown in the present study to comply with environmental issues relating to the use of chemical pesticides.

Key words: Glomus intraradices, G. fasciculatum, G. mosseae, Hyoscyamus niger, Meloidogyne incognita, Pseudomonas fluorescens, root-knot nematode management

Molecular Characterization of Trichoderma Isolates Antagonistic to Fusarium solani causing Dry Root Rot in Acidlime

A Hari Krishna¹ and M Reddi Kumar²

¹Department of Plant Pathology, SV Agricultural College, Tirupati; ²Regional Agricultural Research Station, Tirupati 517502, Andhra Pradesh, India. E-mail: reddi_kumar01@yahoo.com

Abstract

The genetic variation among nine Trichoderma isolates that were antagonistic to Fusarium solani, the dry root rot pathogen of acidlime, was assessed by RAPD and ITS-PCR. Six OPA primers OPA 1, OPA 2, OPA 3, OPA 5, OPA 8 and OPA 9 were used for amplification of genomic DNA. The polymorphism of 91% was generated among the nine isolates of Trichoderma. A total of 254 reproducible and scorable polymorphic bands ranging from 250bp to 2000bp were generated with these six primers. The similarity matrix data revealed that the isolates NT₁, NT₃ and NT₅ were closely similar at their genome level, while the isolates NT₆, NT₇, NT₈ and NT₉ were dissimilar with other isolates. The dendrogram generated with the similarity matrix data by UPGMA analysis showed six main clusters. Cluster I consisted isolates NT₁, NT₃ and NT₅ isolates; Cluster III NT₇ and NT₉; while other clusters had one isolate each. ITS region of rDNA amplification with genus specific ITS-1 and ITS-4 universal primers produced product size varying from 560 to 610 bp in all the isolates indicating polymorphism at ITS region of rDNA among the Trichoderma isolates. The isolates NT₂, NT₆ and NT₇ have shown maximum inhibition of 81.57%, 78.68 and 75.10% respectively, against the test pathogen F. solani while the least inhibition 56.97% was observed with the isolate CT₁ in vitro.

Key words: Acidlime, Fusarium solani, molecular characterization, Trichoderma

Evaluation of Biological, Chemical and IDM Modules for the Management of Anthracnose and Die-Back of Chilli

Chinthagunta Lydia and S Zachariah

Department of Plant Protection, Sam Higginbotom Institute of Agriculture, Technology & Sciences (SHIATS), Allahabad-211007, U.P. India. E mail: lclydiach@gmail.com

Abstract

Three different disease management modules biological, chemical and IDM were evaluated for managing anthracnose and die-back diseases on two chilli cultivars- Ujwala (Local) and Navjyoti (F₁ Hybrid). Disease control by each of the three module was significantly effective in both varieties compared to control. Of the three modules, IDM was found superior to biological and chemical modules with lower incidence and greater disease control, and higher fruit yields in Navajyoti than in Ujawa. IDM module reduced disease incidence on foliage by 54.7% and 65.2%, on fruits by 51.8% and 59.4% and increased fruit yields by 69.7% and 46.8% in cv Navjyoti and Ujwala, respectively. Cost benefit ratio was also more in IDM module (1:1.10) than in chemical (1:1.06) and biological (1:1.04) modules.

Key words: Anthracnose, biological, Colletotricum capsici, chemical, chilli, die-back, IDM

Effect of Dates of Sowing and Inorganic Fertilizers on Leaf Blight Severity of Wheat caused by *Alternaria triticina*

N Surmina Devi¹, Sunita Mahapatra¹ and Srikanta Das¹

¹Department of Plant Pathology, BCKV, Mohanpur, Nadia-741252, West Bengal, ²Department of Plant Pathology, UBKV, Coochbehar, West Bengal, India; E-mail: sridas_bckv@rediffmail.com

Abstract

Field experiments were conducted to evaluate the effects of sowing dates and different levels of inorganic nutrients (NPK) and their combinations on the severity of wheat leaf blight caused by *Alternaria triticina*. Of the five dates of sowing at weekly intervals (21 Nov – 19 Dec) and application of three levels of NPK and their combinations tested, NPK at N₁₅₀ : P₈₀ : K₈₀ applied to 18-19 December sown wheat cv. UP 262 resulted in the lowest disease severity (36.1%) and maximum grain yield (49.0 q ha⁻¹). The disease severity was maximum (56.6%) in the plots treated with N₁₅₀ kg ha⁻¹ with combination of P₆₀ and K₆₀ kg ha⁻¹. Increased levels of nitrogen (150 kg ha⁻¹) and decreased levels of potassium (20 kg ha⁻¹) caused maximum disease severity (56.6%) and poor grain yield (33.0 q ha⁻¹). The best sowing time and optimum fertilization to reduce Alternaria blight and increase wheat yield would be 3rd week of December with N₁₅₀ P₆₀ and K₆₀ fertilization and it would be suitable for reducing the leaf blight disease severity and maximum grain yield of wheat in gangetic alluvial zones of West Bengal.

Key words: *Alternaria triticina*, date of sowing, grain yield, inorganic fertilizers, leaf blight, wheat

Epidemiology and Management of Premature Fruit Drop of Kinnow

Anil Kumar¹ and R C Garg²

¹Central Institute of Temperate Horticulture, Regional Station, Mukteshwar, Nainital 263138 Uttarakhand, ²Department of Mycology and Plant Pathology, College of Horticulture, Dr. Y. S. Parmar University of Horticulture and Forestry, Solan 173230, Himachal Pradesh, India. E-mail: anilrao_mpp@yahoo.co.in

Abstract

A relationship between weather parameters and premature fruit drop of Kinnow (Citrus reticulata) caused by Colletotrichum gloeosporioides was studied and different fungicides were evaluated in laboratory and field for managing this disease. A definite relationship was observed between premature fruit drop of Kinnow and the prevailing temperature, relative humidity and rainfall patterns. All these weather parameters were found positively correlated with the premature fruit drop for two experimental years 2006 and 2007. Regression analysis showed 94.7 and 96.4% influence of weather parameters on the prevalence of the disease in 2006 and 2007, respectively. Most systemic and non-systemic fungicides inhibited mycelia growth of C. gloeosporioides in vitro. Systemic fungicides viz., carbendazim, difenoconazole and non-systemic viz., propineb inhibited maximum fungal growth under in vitro. In two consecutive years of field experiments all tested systemic and non-systemic fungicides reduced the incidence of premature fruit drop of Kinnow. Under field condition also, carbendazim, difenoconazole and propineb provided maximum disease control ranging from 80.5 to 82.5%.

Key words: Colletotrichum gloeosporioides, fungicides, Kinnow, premature fruit drop, weather parameters

Efficacy of Hot Water Treatment, Wrapping and Waxing on Blue Mould Rot of Kinnow (Citrus reticulata) Fruits

Chhagu Lal Gurjar, GS Rathore, S Gangopadhyay and Atul D Gawande

Department of Plant Pathology, SKRAU, Bikaner- 334006, Rajasthan India; E-mail:- chhagugurjar@yahoo.in

Abstract

Investigation on effect of hot water treatment, wrapping and waxing on blue mould rot due to Penicillium italicum was carried out in kinnow (Citrus reticulata) fruits under artificial inoculation using cork-borer injury method. Hot water treatment at 55C proved most effective in checking the blue mould severity. Heat shrinkable polyethylene film provided maximum protection of the disease. The percent disease reduction index recorded was higher in heat shrinkable polyethylene film and perforated polyethylene bag than other packing materials, like butter paper, news paper and plain paper. The dipping of fruits in potassium metabisulphite solution (0.25%) followed by treating with paraffin wax (20%) gave maximum control of blue mould rot. Boric acid (0.25%) along with paraffin wax treatment used at higher concentrations i.e. 15 and 20% also reduced the disease significantly over the untreated control.

Key words: blue mould rot, Citrus reticulata, hot-water treatment, kinnow, Penicillium italicum, waxing, wrapping

Evaluation of Biocontrol Agents and Fungicides for the Management of Blast Disease of Finger Millet

R Senthil, S Shanmugapackiam and T Raguchander*

Department of Plant Pathology, Centre for Plant Protection Studies, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India. E-mail: raguchander@rediffmail.com

Abstract

A field experiment was conducted during kharif for three consecutive years (2009-2011) to evaluate the efficacy of biocontrol agents, fungicides and their combination to control blast disease in finger millet caused by Pyricularia grisea. Two sprays of edifenphos (0.1%) first at 50 % flowering and second at 10 d later significantly reduced blast disease incidence. Further spraying of bacterial bioagent Pseudomonas fluorescens (Pf 1) (0.6%) as first spray + pre-mixture fungicides (carbendazim+mancozeb) @ 0.2 % as second spary was found to be the next best treatment for blast reduction. Application of talc-formulated Pf1 (0.6%) also showed reduction in blast incidence and increased the yield in finger millet. The application of biocontrol agents viz., Pf1, Pf2 and Pf3 which were on par with each other in reducing the blast disease as compared to control. The highest grain yield (2659.9 kg ha⁻¹) was recorded in edifenphos (0.1%) treated plots which was at par with Pf1 (0.6%) + spraying of pre-mixture fungicide (carbendiazim + mancozeb) @ 0.2% which recorded a yield of 2638.9 kg ha⁻¹. Two sprays of P. fluorescens Pf1 (0.6%) a higher yield (2646 kg ha⁻¹) compared to control (2356.9 kg ha⁻¹).

Key words: Biocontrol, Pseudomonas fluorescens, Trichoderma harzianum, fungicide, Pyricularia grisea,

Detection of Aflatoxins $B_1$ and $B_2$ in Tomato (*Lycopersicon esculentum*) cv. Marglobe Infected with *Aspergillus flavus*

Shallu Samyal and Geeta Sumbali

*Department of Botany, University of Jammu, Jammu -18000, Jammu and Kashmir, India. E-mail: geetasumbalipay@yahoo.co.in*

**Abstract**

Diseased tomato fruits of cv. Marglobe collected from markets of Jammu city yielded 25 isolates of *A. flavus*. These isolates were analyzed for their aflatoxin producing potential after inoculation into healthy and ripe tomatoes of the same variety. Results showed that 64% of the pathogenic *A. flavus* isolates were toxigenic and were detected to be positive for aflatoxins AFB$_1$, and AFB$_2$. Quantitatively, AFB$_1$ and AFB$_2$, detected in the *A. flavus* infected tomatoes cv. Marglobe were considerably high, ranging from 141.6 - 1481.3 and 49.0 - 2497.6 µg$^{-1}$ respectively, that was much beyond the regulatory limit of 20 µg kg$^{-1}$ fixed by WHO, and represents a potential hazard, considering that these toxins may be transferred into processed food products.

**Key words:** *Aspergillus flavus*, aflatoxins, tomato

**Citation:** Samyal S and Sumbali G. 2012. Detection of aflatoxins B$_1$ and B$_2$ in tomato (*Lycopersicon esculentum* cv. Marglobe) infected with *Aspergillus flavus*. *J Mycol Pl Pathol* 42(4): 459-462.
Assessing the Role of Biochemical Constituents in Resistance to Alternaria Blight in Rapeseed-Mustard

Moni Gupta¹, Baby Summuna², Sachin Gupta³ and SA Mallick⁴

¹Division of Biochemistry & Plant Physiology; ²Division of Plant Pathology, Faculty of Agriculture-Chatha, Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu, Jammu 180009, Jammu & Kashmir, India. E-mail: sachinmoni@gmail.com

Abstract

The present study was conducted to assess the role of different biochemical constituents in imparting resistance to rapeseed-mustard against Alternaria blight caused by Alternaria brassicae. Higher amount of total sugars were present in healthy leaves and pods of moderately resistant genotypes at pre-inoculation stage and the lowest in the diseased samples of highly susceptible genotypes at pre-inoculation stage. Total soluble proteins were highest in the healthy samples of susceptible plants at pre-harvest stage while it was lowest in diseased samples of moderately resistant genotypes at pre-inoculation stage. It was observed that with increase in infection of A. brassicae the protein content increased. Higher amount of total phenols was observed in diseased samples as compared to healthy leaves and pods and it was higher in moderately resistant varieties at pre-harvest stage. Present investigations on total chlorophyll content revealed that higher content was observed in healthy leaves and pods of moderately resistant varieties as compared to diseased leaves and pods. The highest total carotenoid content was found in the diseased samples of highly susceptible genotypes at pre-harvest stage and the lowest was recorded at pre-inoculation stage in the healthy samples of moderately resistant genotypes. Positive correlations were found between disease intensity and total soluble proteins, total phenols and total carotenoids, while correlations were negative between disease intensity and total sugars, total chlorophyll content in both moderately resistant as well as highly susceptible varieties.

Key words: Alternaria blight, Alternaria brassicae, rapeseed-mustard, chlorophyll, carotenoid, protein, sugar

Identification of Pomegranate Fruit Rot Pathogens and an Antagonist
*Lactococcus lactis* ssp. *cremoris* PB6

Milind H Gajbhiye, Divya Prakash and Balasaheb P Kapadnis

Department of Microbiology, University of Pune, Pune, - 411007, Maharashtra, India. E-mail: bpkapadnis@yahoo.com

**Abstract**

Six fungal genera viz., *Alternaria, Phomopsis, Aspergillus, Fusarium, Penicillium* and *Helminthosporium* were found associated with fruit rot of pomegranates. Of these, 40.7% belonged to *Alternaria alternata*, 14.8% to *Phomopsis varsoniana*, 14.8% to *Aspergillus niger*, 7.4% to *Fusarium graminearum*, 14.8% to *Penicillium* sp. and 7.4% to *Helminthosporium* sp. All the fungal pathogens produced hydrolases, like pectinase and protease, but only 70% were cellulase producers indicating that pectinase was mainly involved in fruit rot disease. Lactic acid bacterium from pomegranate, *Lactococcus lactis* ssp. *cremoris* PB6 exhibited broad antifungal spectrum as it inhibited the growth of all the fungal pathogens tested. This isolate was the most successful colonizer of fruits and its population was significantly higher (*P*<0.05) than other treatments. In the biocontrol experiment, the isolate *Llc* PB6 was active at par with a chemical fungicide, Dithane M45 in controlling fruit rot caused by *A. alternata*. Also there was significant difference between the test and control. Thus, the development of rot was delayed due to *Llc* PB6, which could be used as a possible biocontrol agent for *Alternaria* fruit rot of pomegranate.

**Key words**: biocontrol, fruit rot, *Lactococcus lactis* ssp. *cremoris* PB6, pomegranate

Symptomatology and Transmission of Sesame Phyllody Disease caused by Phytoplasma

DM Pathak¹, A M Parakhia² and LF Akbari³

¹Office of Programme Co-Ordinator, ²Directorate of Extension Education, ³Department of Plant Pathology, Junagadh Agricultural University, Junagadh - 362 001, Gujarat, India. E-mail: pathakkvk@yahoo.co.in

Abstract

The investigation was conducted to study symptomatology, etiology and transmission of the phyllody disease of sesame. Floral virescence, phyllody and proliferation were the most common symptoms. Sometimes these symptoms were accompanied by yellowing and cracking of seed capsules. Shoot apex fasciation was also observed occasionally. Pleomorphic bodies (phytoplasma) were observed in phloem sieve elements in diseased plants using electron microscope. Phyllody disease was successfully transmitted by grafting and by leafhopper (Orosius albicinctus).

Key words: etiology, phyllody, Sesamum indicum, symptomatology, transmission

Evaluation of Antagonists to Rhizoctonia solani Causing Wet Root Rot in Chickpea

Pawan Kumar Panwar and VK Gaur

Department of Plant Pathology, College of Agriculture, Swami Kehshwanand Rajasthan Agricultural University, Bikaner-334001, Rajasthan, India. Email: pawanpanwar2007@rediffmail.com

Abstract

Two fungi Trichoderma harzianum and T. Viride, and one bacterium Bacillus subtilis isolated from chickpea fields at Bikaner were tested for their antagonistic activity against seven isolates of Rhizoctonia solani causing wet root rot of chickpea on Czapek's dox medium. Inhibition of the mycelium growth of R. solani isolates by T. harzianum, T. viride and B. subtilis varied from 56.9 to 70.1, 44.6 to 69.4 and 43.5 to 55.6%, respectively. Maximum growth inhibition was caused by T. harzianum. In a greenhouse experiment, these antagonists reduced root rot incidence in a susceptible chickpea variety C-235 up to 60, 65 and 50%, respectively as compared to control where 100% mortality was observed. T. viride was most effective in reducing the disease followed by T. harzianum and B. subtilis.

Key words: Antagonists, Bacillus subtilis, bio-control, chickpea, Rhizoctonia solani, Trichoderma harzianum, T. viride, wet root rot

Host Range and Pathogenic Variation in Isolates of *Rhizoctonia solani* Incitant of Wet Root Rot in Chickpea

Pawan Kumar Panwar, VK Gaur and Lekhraj Katariya

Department of Plant Pathology, College of Agriculture, Swami Kehshwanand Rajasthan Agricultural University, Bikaner-334006, India. E-mail: vkg_rau@yahoo.com

Abstract

Studies were conducted to find out the extent of host range and pathogenic variation among seven isolates of *Rhizoctonia solani* collected from Rajasthan, Haryana and New Delhi. All seven isolates tested for their pathogenicity using susceptible varieties viz. C-235 of chickpea, RC-101 of cowpea, RMO-225 of mothbean and RMG-344 of mungbean, had varying disease incidence levels in pot culture experiment using sterilized and unsterilized soil. The isolate Hisar-2775 on chickpea, Delhi-4097 on cowpea and Hisar-2775 on mothbean were highly virulent in both types of soil, while Delhi-4097 was highly virulent on mungbean in sterilized soil but not in unsterilized soil. Contrary to this the isolate Hisar-2775 was highly virulent in unsterilized soil. The incidence of disease appeared first on mungbean followed by chickpea, mothbean and cowpea in both soil types.

Key words: chickpea, pathogenic variations, *Rhizoctonia solani*

Bioefficacy of Different Chemical Fungicides for Management of Mango Powdery Mildew in South Gujarat

Hemant Sharma, G B Kalaria, P D Ghoghari and Vikas Khandelwal

All India Co-ordinated Research Project (Sub Tropical Fruits), Agriculture Experimental Station, Navsari Agricultural University, Paria, Gujarat; Department of Botany, Navsari Agricultural University, Navsari, Gujarat, India. E-mail: drhsharma@yahoo.com

Abstract

Powdery mildew of mango caused by Oidium mangiferae has become a serious and widespread problem in many parts of India, including South Gujarat. A field experiment was conducted for three seasons (2007-2010) to investigate the efficacy of six fungicides, triadimefon (Bayleton 25% WP), fenarimol (Rubigan 12% EC), flusilazole (Punch 40% EC), penconazole (Topas 10% EC), wettable sulphur (Sulfex 80% WP) and dinocap (Karathane 48% EC) along with control (water spray) against mango powdery mildew on the most popular cv Alphonso. Each fungicide was sprayed thrice at 15-d-intervals on to newly emerged panicles of second flush of cultivar Alphanso and data on disease severity and fruit yields were taken 10d after the last spray. The fungicide flusilazole @ 0.015% (Punch 40% EC) was found most effective in reducing the disease (6.26%) and increasing the fruit yield (75.97 kg tree⁻¹) compared to 50% disease severity and 43.94 kg tree⁻¹ fruit yield in control.

Key words: chemical fungicides, mango, Oidium mangiferae, powdery mildew

Morphological, Pathological and Biochemical Variations among *Nomuraea rileyi* Isolates

YV Ingle, YN Mohod, KD Thakur and VV Deshmukh

Department of Plant Pathology, Dr. PDKV, Akola-444001, Maharashtra, India E mail: yog_ingle@rediffmail.com

Abstract

Six isolates of an entomopathogenic fungus *Nomuraea rileyi* were characterized for their morphological, cultural, pathological characteristics and their protein profile. The isolates varied considerably for morphological and cultural characteristics, such as colony colour, growth pattern, conidial production and size of conidia on SMAY (Saboraud's Maltose Agar + Yeast extract) medium. In pathogenicity test on third instar larvae of *Helicoverpa armigera* the local isolate Nr-PDKV isolate was found to be the most virulent causing 86.7% mortality in 120.17 h followed by Nr-DHW that caused 76.7% mortality in 132.15 h. Mycelial protein profiles of these isolates exhibited significant variations in their electrophoresis patterns. The isolates from Dharwad (Nr-DHW), Banglore (Nr-BNG) and Hyderabad (Nr-HYD) shared different similarities among themselves while Nr-PDKV and Nr-AL exhibited close similarity.

Key words: Cultural and morphological characters, *Helicoverpa armigera*, *Nomuraea rileyi*, pathogenic variations, protein profile

Evaluation of Distribution of *Trichoderma* Species in Soils of Marathwada Region of Maharashtra during 2007-2011

UN Bhale and JN Rajkonda

1Research Laboratory, Department of Botany, Arts, Science and Commerce College, Naldurg, Tq.Tuljapur, Dist Osmanabad 413602, Maharashtra; 2Department of Botany, Yeshwantrao Chavan College, Tuljapur, Dist. Osmanabad 413601, Maharashtra, India; E-mail: unhale2007@rediffmail.com

Abstract

The distribution of *Trichoderma* species in soils of Marathwada region of Maharashtra in relation to land use practices was investigated during 2007-2011 through dilution plating. A total of 105 soil samples from 10 locations of varying soil types were assayed. The highest number of fungi were recorded from soil samples from Parbhani (26.5×10^7 cfu g⁻¹) while least from Aurangabad (7.3×10^7 cfu g⁻¹). Maximum population of *Trichoderma* (1.01× 10^7 cfu g⁻¹) was recorded in soil of Latur followed by Hingoli. Maximum number of *Trichoderma* species were recorded from the sample from Hingoli and Latur (6 species) followed by Nanded, Jalna and Udgir, while the lowest number of species (3) was found from Beed and Parbhani. Occurrence of *Trichoderma* species was found in all the fields of Latur, Parbhani and Udgir whereas only 50% samples from Beed and Hingoli yielded *Trichoderma* species. Out of six species, *T. harzianum* was predominant in all locations, and *T. longibrachiatum* had low populations in Marathwada region. *Trichoderma* showed tolerance to soil acidity since it was abundant in the most acidic soils. Land use intensification seems to have affected *Trichoderma* distribution negatively.

Key words: Marathwada region, soil sample, *Trichoderma* spp,

Biological Control of Burrowing Nematode (*Radopholus similis*) in Banana

**N Thammaiah, VC Kanamadi, AM Shirol, V Devappa, GSK Swamy and HR Basavarajappa**

AICRP on Tropical Fruits, K.R.C. College of Horticulture, Arabhavi-591310, Belgaum, Karnataka, India.

Email. nthammaiah@gmail.com

**Abstract**

Field trials were conducted for two consecutive years (November 2004 – February 2006 and July 2006- August 2007) for developing an effective and economical management of burrowing nematode in banana, using neem cake, farm yard manure (FYM), *Paecilomyces lilacinus*, carbofuran and sunhemp intercropping. Intercropping with sunhemp effectively reduced the nematodes population followed by *P. lilacinus* at 10g infected grains plant\(^{-1}\) + FYM at 500 g plant\(^{-1}\) and *P. lilacinus* + neem cake at 250g plant\(^{-1}\). The highest yield (27.26 t ha\(^{-1}\)) was recorded in the sunhemp intercropping, followed by carbofuran at 40 g plant\(^{-1}\) (26.96 t ha\(^{-1}\)) and *P. lilacinus* + neem cake (24.64t ha\(^{-1}\)). The treatments also improved fruit quality parameters and benefit–cost ratio.

**Key Word**: Banana, Burrowing nematode, *Crotalaria juncea*, *Paecilomyces lilacinus*

**Citation**: Thammaiah N, Kanamadi VC, Shirol AM, Devappa V, Swamy GSK and Basavarajappa HR. 2012. Biological control of burrowing nematode (*Radopholus similis*) in banana. *J Mycol Pl Pathol* 42(4): 509-512.
**Abstract**

Sunflower (*Helianthus annuus*), one of the important edible oilseed crops in the state of Karnataka, is affected by many fungal diseases, and downy mildew caused by *Plasmopara halstedii* is of major economic importance. In the present study, culture filtrates of three strains of *Trichoderma harzianum*, a plant growth promoting fungus (PGPF), were tested for their efficacy to promote plant growth and reduce downy mildew incidence in sunflower. The culture filtrates of all the three strains of *T. harzianum* effectively inhibited the sporulation of *P. halstedii* in vitro. The strain PGPFJSB-19 was highly effective in inhibiting the sporulation compared to other strains. Seed treatment with culture filtrate significantly enhanced germination and seedling vigor over the untreated control. PGPFJSB-19 provided maximum germination of 87% and vigor index of 1198 compared to 79% germination and 972 vigor index in control. PGPFJSB-19 treated seed recorded downy mildew incidence of 26% and 18% compared to 90% and 80% in control under greenhouse and field conditions, respectively. Further, seed treatment with culture filtrates significantly enhanced the growth and reproductive parameters of sunflower both under greenhouse and field conditions. Thus, strains of *T. harzianum* and their culture filtrates may be used as eco-friendly disease management strategies for sunflower downy mildew.

**Key words:** growth promotion, induction of resistance, *Plasmopara halstedii*, Sunflower downy mildew, *Trichoderma harzianum*,

Cultural and Pathogenic Variability among Isolates of *Rhizoctonia bataticola* causing Dry Root Rot in Chickpea

Lekhraj Katariya¹, VK Gaur² and Pawan Kumar Panwar³

¹Locust Warning Organisation, Nagnechiji Road, Pawanpuri, Bikaner-334 003, Rajasthan ²Department of Plant Pathology, College of Agriculture, Rajasthan Agricultural University, Bikaner- 334 006, Rajasthan, India. Email-rajpath07@gmail.com

Key words: chickpea, dry root rot, pathogenic variability, *Rhizoctonia bataticola*

Evaluation of Fungal Bio-agents and Plant Extracts for the Management of *Meloidogyne incognita* in Tomato

Garvita Joshi, Subhash Bhargava and MK Sharma

Postgraduate Department of Nematology, Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology, Udaipur-313 001, Rajasthan, India; E-mail: garvita.garvitajoshi.joshi@gmail.com

Key words: fungal bio-control agents, *Meloidogyne incognita*, plant extracts, root-knot nematode, tomato

Short Communication

Detection of *Annellophragmia coonoorensis* Subram.- a New Record of Sooty Mold Fungus of *Butea monosperma* (Lam.) Taub.

Rashmi Dubey¹ and A K Pandey²

¹Botanical Survey of India, Western Regional Centre, Pune-41100, Maharashtra; ²M. P. Private University Regulatory Commission, Bhoj Vishwavidhalaya, Bhopal-462042, Madhya Pradesh, India. Email: dr.rashmidubey@gmail.com

Key words: *Annellophragmia coonoorensis, Butea monosperma*

A New Record of *Phytophthora ramorum* causing Leaf Fall and Shoot Rot of Nutmeg (*Myristica fragrans*)

Sally K Mathew and S Beena

Department of Plant Pathology, College of Horticulture, Vellanikkara, Thrissur 680656, Kerala, India
E-mail: sallykmathew@yahoo.com

**Key words:** Leaf fall and shoot rot, nutmeg, *Phytophthora ramorum*

**Citation:** Mathew SK and Beena S. 2012. A new record of *Phytophthora ramorum* causing leaf fall and shoot rot of nutmeg (*Myristica fragrans*). *J Mycol Pl Pathol* 42(4): 529-533.
Potential of Novel Action Fungicides against Potato Late Blight Caused by Phytophthora infestans

Sanjay Goswami¹, R Kaur², S Raheja³ and TS Thind⁴

¹National Bureau of Agriculturally Important Microorganisms (NBAIM, ICAR), Mau Nath Bhanjan, Mau-275101, UP. ²Department of Plant Pathology, Punjab Agricultural University, Ludhiana 141004, Punjab, India. E-mail: sanjaygoswami65@gmail.com

Key words: fungicides, late blight, Phytophthora infestans, potato

Short Communication

Detection and Role of Siderophores in Imparting Disease Resistance in Ginger against *Ralstonia solanacearum* by PGPR Isolates

Reshmy Vijayaraghavan¹ and Koshy Abraham²

¹Krishi Vigyan Kendra, Ambalavayal, Wayanad, Kerala-673 593; ²Krishi Vigyan Kendra, Thrissur, Kerala-680 651, India.
Email: reshmydanesh@yahoo.co.in

**Keywords:** CAS assay, ginger, PGPR, *Ralstonia solanacearum*, siderophores