Mycopath 2003, 1(1): 1-5

Extent of Shisham (*Dalbergia sissoo* Roxb.) Decline in Sialkot, Gujranwala, Lahore and Sargodha Districts

Rukhsana Bajwa, Arshad Javaid and M. Babur Mahmood Shah

Department of Botany, University of the Punjab, Quaid-e-Azam Campus, Lahore, Pakistan

Abstract

A thorough survey of four districts of Punjab viz. Sialkot, Gujranwala, Lahore and Sargodha was carried out during May-June 2003 to study the present scenario of shisham (*Dalbergia sissoo* Roxb.) decline in these areas and to find out relationship, if any, between disease severity and edaphic conditions. From each of the four districts, canal banks, highways and roadsides, and agricultural lands were surveyed. In Lahore surveyed areas also included University of the Punjab, Aitchison College and roadside along the canal bank of BRB Lahore Branch. From each district 700 – 1200 plants were observed. Shisham trees were found to be attacked with two types of diseases viz. wilting and dieback, the latter being the more prevalent than the former. Maximum mortality of 75 – 80 % was observed along the canal banks except BRB Lahore branch. Along the highways and roadsides 20 – 40 % plants were found dead. In the Punjab University about 10 % plants were found dead while 17 % were affected with dieback and wilting ranging from mild infection to highly diseased. The least disease incidence and mortality rate was observed on plants growing on agricultural lands, along the roadside of BRB Lahore branch and in Aitchison College. Disease incidence and severity seemed to have no relation with soil pH. Generally older plants were found to be more susceptible to the disease attack than the younger ones. It was concluded that plant resistance to disease attack was associated with proper irrigation management. Apparently stressed conditions especially high soil moisture content is responsible for the attack and severity of the disease. It is recommended that along the canal bank shisham should be replaced with *Eucalyptus* spp. Furthermore, seeds from the resistant shisham plants, standing healthy among the hundreds of dead ones along the canal banks, should be used to raise nurseries for shisham plantation on suitable places away from the canals.

Key words: *Dalbergia sissoo*, dieback, wilting, Punjab.

Mycopath, 2003 1(1): 7-14

Antifungal Activity of Allelopathic Plant Extracts III. Growth response of some pathogenic fungi to aqueous extract of *Parthenium hysterophorus*

Rukhsana Bajwa and Afia Khalid

Department of Botany, University of the Punjab, Quaid-e-Azam Campus, Lahore, Pakistan

Abstract

The present investigations were designed to evaluate the potential of aqueous extracts of allelopathic weed, *Parthenium hysterophorus*, against three pathogenic fungi viz., *Drechslera tetramera, Aspergillus niger* and *Phoma glomerata*. The test fungal species were grown in 100 ml liquid malt extract medium containing 20 ml of each of 0, 10, 20, 30, 50, 60 and 70 % w/v shoot extract of *Parthenium hysterophorus.* Fungal growth was monitored periodically after 5, 10 and 15 days of incubation. A highly contrasting response was exhibited by the test pathogens to employed extract treatments. The lower concentrations of 10, 20 and 30% extract exhibited antifungal activity resulting in a pronounced decrease in fungal biomass production. The response to extract was species-specific. *Drechslera tetramera* was the most susceptible while *Phoma glomerata* was found to be least susceptible to the applied aqueous extracts. The higher concentrations of 50, 60 and 70 % extract markedly enhanced the fungal biomass production at all the harvest intervals.

Key words: Allelopathy, *Parthenium hysterophorus, Drechslera tetramera, Aspergillus niger, Phoma glomerata.*

Mycopath, 2003 1(1): 15-30

Role of VAM in alleviating allelopathic stress of *Parthenium hysterophorus* on maize (*Zea mays* L.)

Rukhsana Bajwa, Jabeen Akhtar and Arshad Javaid

Department of Botany, University of the Punjab,
Quaid-e-Azam Campus, Lahore, Pakistan

Abstract

Experiments were conducted to evaluate the impact of allelopathic potential of *Parthenium hysterophorus* on germination, growth and yield of maize (*Zea mays* L.) as well as the role of Vesicular Arbuscular Mycorrhizae (VAM) in alleviating allelopathic stress. In the first experiment germination and seedling growth response of maize to 5, 10, 15, 25 and 50 % w/v aqueous extract of *P. hysterophorus* was studied in petri dishes. Higher concentrations of 25 and 50% aqueous extract of Parthenium significantly reduced the germination of maize grains. Root and shoot growths of seedlings were also similarly affected. In the other experiment, shoot material of *P. hysterophorus* was cut into very small pieces and mixed in the heat sterilized pot soil @ 0, 5 and 10 % w/w, half the pots were inoculated with VAM. The results regarding the various vegetative and reproductive growth parameters revealed that the maize crop was not susceptible to applied rates of *P. hysterophorus* Mulch, the maize growth was considerably enhanced in 5 % treatment while in 10 % mulch treatment crop growth was as good as in control while plants inoculated with VAM showed markedly enhanced the crop growth both in control as well as *Parthenium* mixed treatments. Mycorrhizal colonization was markedly suppressed by mixing shoot material of *P. hysterophorus* at vegetative growth stage especially in 10 % treatment.

Key words: *Parthenium hysterophorus*, maize, vesicular arbuscular mycorrhizae, allelopathy.

Mycopath, 2003 1(1): 31-34

Physiological studies on *Macrophomina phaseolina* (Tassi) Goid

Shahid A. Khanzada, S.M. Iqbal and A.M. Haqqani

Pulses Programme, National Agricultural Research Centre, Islamabad

Abstract

In vitro physiological studies on mycelial growth of *Macrophomina phaseolina* (Tassi) Goid revealed that the fungus grew best on cornmeal agar out of five culture media that were tried. All the carbon sources were found to be more or less equally good while peptone was the best among the nitrogen sources. Growth of *M. phaseolina* was maximum at 30^0C after 7 days of inoculation, which was reduced significantly below 20^0C and above 35^0C. All the tested pH levels (6.0 to 8.0) were found equally suitable for growth of fungus.

Key words: *Macrophomina phaseolina*, culture media, pH, carbon, nitrogen, mycelial growth.

Mycopath, 2003 1(1): 35-38

Nutritive value of mushrooms from Azad Kashmir, Pakistan

Mubbasher Sabir, Abdul Khaliq, Riaz Ali Gardezi and Haleem Khan

University college of Agriculture Rawalakot -12350 Azad Kashmir
E-mail:mubashersabir@yahoo.com

Abstract

Experiments were carried out to find out the chemical composition of eleven species of edible mushrooms reported from the Forests of Azad Kashmir. The results obtained were compared with vegetables, pulses and those of *Lentinus edodes*, the cultivated Shiitake mushroom. Chemical constituents analyzed included total dietary fiber, crude protein, fat, ash, moisture and carbohydrate. Despite the differences in the chemical composition of mushroom samples, the overall nutritional values of the mushrooms were good.

Key words: Edible mushrooms, proximate analysis, Forests of Azad Kashmir, high protein content, low fat

Mycopath, 2003 1(1): 39-47

Variation in conidial concentration of freshwater hyphomycetes in a semi-tropical canal water habitat

Firdaus-e-Bareen and S.H. Iqbal*

*Department of Botany and *Department of Mycology & Plant Pathology, University of the Punjab, Quaid-e-Azam Campus, Lahore 54590, Pakistan.*

Abstract

The freshwater hyphomycete conidial numbers showed a characteristic pattern of fluctuation under the influence of temperature and biomass deposition in the Lahore Branch of the BRB canal. The conidial numbers showed a gradual increase from 2% in June to 39% in October. The clearing of the substratum from the canal in January played a significant role in the decline of conidial concentration from 13% in December to 6% in February. The total number of hyphomycete species showed an increase from 20 in April to 39 in December.

Mycopath, 2003 1(1): 49-52

Physiological studies on *Fusarium moniliforme* Sheld, the causal organism of Bakanae disease of rice

M. Aurangzeb, Shafqat Ali, * Bashir Ilyas and **M.Arshad Gill

*Botany Department, Govt.F.C.College,Lahore *Department of Plant Pathology University of Agriculture, Faisalabad, **Rice Research Institute, Kala Shah Kaku, Sheikhupura*

Abstract

Physiological studies on factors affecting the mycelial growth of *Fusarium moniliforme* Sheld., i.e., culture media, temperature, pH level, light duration and fungicide concentrations, were carried out. Potato dextrose agar medium (PDA) was found to be the best for the mycelia growth followed by Wakasman's agar, Basal medium, Czapeck's dox agar and Richards medium. The fungus showed significant growth within a range of 25-30^{o}C, the best growth was observed at 30^{o}C. Neutral pH (7) favoured the mycelial growth more as compared to other values. The effect of light and dark period on fungal growth was insignificant, however significant results were obtained when light was given for a continuous period of 24 hours. In vitro test of fungicides on mycelial growth of the fungus revealed that Benlate and Derosal inhibited the mycelial growth of the fungus completely, rather than other fungicides.

Mycopath, 2003 1(1): 53-59

Use of 2,4-dichlorophenoxyacetic acid (2,4-D) to facilitate bacterial infection of roots

F. Azam

Nuclear Institute for Agriculture and Biology, Faisalabad, Pakistan
E-mail: asim6006@fsd.comsats.net.pk

Abstract

2,4-dichlorophenoxy acetate (2,4-D) is a commonly used herbicide for the control of broad-leafed weeds in wheat, maize and rice. Its auxin-like action has been extensively exploited for induction of roots in plant tissue cultures. Over the past few years, however, 2,4-D has become focus of attention because of its potential to modify plant roots vis-à-vis bacterial infection. This role of 2,4-D has immense significance in understanding the mechanism of legume-*Rhizobium* symbiosis and extending this phenomenon to cereal crops. The need to make the plant roots harbour bacteria (particularly those capable of fixing atmospheric nitrogen) and the role of 2,4-D in facilitating the process has been reviewed.

Mycopath, 2003 1(1): 61-62

Screening for *Ascochyta* Blight Resistance in Chickpea (*Cicer arietinum* L.)

S.S Alam, M. Hassan, M.A. Haq, T.M. Shah, B.M. Atta, H. Syed

Mutation Breeding Division, Nuclear Institute for Agriculture and Biology
P.O. Box 128, Faisalabad, Pakistan

Abstract

Ten chickpea lines CM1966/93, CMC77S, CM843/98, CM1223/98, CM1441/98, CM2070/98, CC 104/99, CC106/99, CC124/00 were found highly resistant to Ascochyta blight with disease rating of 2 followed by 34 lines that were resistant and 21 lines were tolerant. None was found immune to blight. The highly resistant lines have exhibited higher level of resistance against blight as compared to earlier released varieties (CM72, CM88 and CM2000).

Mycopath, 2003 1(1): 63-66

A re-evaluation of geographical distribution of charcoal rot on sunflower crop in various agroecological zones of Pakistan

Khan, S.N., Ayub, N.* and Ahmed, I.**

*Department of Mycology and Plant Pathology, University of the Punjab, Lahore, Pakistan (Correspondence salik_nawaz@yahoo.com); *Department of Biological Sciences, Quaid-i-Azam University Islamabad; **IPM, FAO/Crop Disease Research Institute, National Agriculture Research Center, Park Road, PO NIH, Islamabad, Pakistan*

Abstract

A countrywide survey was conducted to update the status of charcoal rot on sunflower crop in Pakistan. During survey, charcoal rot was observed as a serious threat to sunflower. The areas like Bahawalpur, Rahim Yar Khan and Sahiwal which were reported disease free in 1996, showed occurrence of the disease but Sahiwal showed high incidence and severity in 1999. Distribution of the disease in Sindh, Punjab and NWFP provinces was 85, 83 and 48% respectively. Among Provinces NWFP showed highest incidence57%, and Punjab exhibited highest severity 2.62 according to 0-5 severity rating scale. Continuous increasing trend of charcoal rot is alarming for farmers and authorities engaged in sunflower business.

Mycopath, 2003 1(1): 67-80

Endogonaceous spore flora of Pakistan. IX. Frequency of occurrence of VAM fungi in wheat fields around Punjab University Campus area

Ghazala Nasim and Rukhsana Bajwa

Department of Botany, University of the Punjab, Quaid-e-Azam Campus, Lahore-54590, Pakistan

Abstract

For the screening of Endogonaceous spore types the rhizosphere soil was sampled randomly from three adjacent wheat fields around new University campus. Spore extraction was done following wet sieving and decanting technique and direct soil paste method. Decaying root pieces and sheathing leaf bases on decaying wheat stumps were also studied after staining.

A total of forty spore types were recorded from soil samples and decaying plant debris. Species of *Glomus* predominated the samples. There were twenty-eight species of *Glomus* recorded in the soil samples. One *Glomus* species i.e., *Glomus monosporum* formed sporocarps in the decaying sheathing leaf bases of left over wheat stumps after the crop was harvested. Four species of *Acaulospora*, three species of *Sclerocystis*, two species each of *Gigaspora* and *Scutellospora* were recorded. Among highly abundant species were *Glomus fasciculatum, G. mosseae, G. constrictum, G. aggregatum,* and *G. microaggregatum*.

Key words: Endogonaceous spores, VAM, wheat field, *Glomus*

Mycopath, 2003 1(1): 81-83

Resistance in Mungbean to bacterial leaf spot disease

S.M. Iqbal, M. Zubair, M. Anwar and A.M. Haqqani

Pulses Programme, National Agricultural Research Centre, Islamabad

Abstract

Fifty-eight mungbean genotypes/cultivars of indigenous as well as exotic origin were screened against natural infection of bacterial leaf spot disease under field conditions at National Agriculture Research Centre, Islamabad during Kharif season of 2002. Two genotypes exhibited highly resistant reaction, 10 displayed resistant reaction and 18 were tolerant, while the rest were either susceptible or highly susceptible against the disease. Identified resistant sources may be exploited for the development of high yielding disease resistant cultivars of mungbean by using in hybridization programme.

Key Words: Mungbean, *Vigna radiata*, bacteria, genotypes, resistance.

Mycopath, 2003 1(1): 85-94

Effect of foliar application of *Ascochyta rabiei* on growth and vesicular arbuscular mycorrhizal status of eight chickpea varieties

Ghazala Nasim, Munawar Din*, Shahbaz Ali and M. B. Ilyas*****

*Department of Botany, University of the Punjab, Quaid-e-Azam Campus, Lahore-54590; *Cathedral School, Behind Jinnah Cricket Stadium, Small Civil lines, Gujranwala; ** Government Degree College for Boys, Murree; ***Department of Plant Pathology, University of Agriculture, Faisalabad, Pakistan.*

Abstract

Eight different (resistant and susceptible) chickpea varieties were studied for various growth parameters including vesicular arbuscular mycorrhizal status. This study was carried out before and after the spray of the pathogen, *Ascochyta rabiei* and the results were evaluated.

Resistant varieties showed significantly high values for growth parameters studied. Vesicular arbuscular mycorrhizal infections especially arbuscules were recorded high for resistant varieties. In contrast susceptible varieties showed a noticeably low values for all growth parameters. However as far as their mycorrhizal status is concerned, significantly high values for vesicular infections were observed.

Mycopath, 2003 1(1): 95-98

New Ectomycorrhizas in association with Poplar from Himalayan moist forests of Pakistan

Abdul Nasir Khalid and Abdul Rehman Niazi

Department of Botany, University of the Punjab, Lahore, 54590, Pakistan

Abstract

Populinirrhiza pinnata and *populinirrhiza khanspurensis* are described and illustrated as new ectomycorrhizas from Himalayan moist temperate forests of Pakistan in association with the root system of *Populus ciliata. Populinirrhiza pinnata* has monopodial pinnate type of ramification. The young mycorrhizas are dark brown while the older ones are black. White sugary crystals are present on mycorrhizal system. Emanating hyphae surround mycorrhizas. Rhizomorphs are thick and branched. *Populinirrhiza khanspurensis* has a simple to monopodial type of ramification. The color of the young mycorrhiza is brown; some times with dark tips while the older ones are dark brown. Rhizomorph and emanating hyphae are absent. As so far no fungal partner of these mycorrhizas has been identified, these fall under the category of 'unknown' and 'unidentified' mycorrhizas.

Key words: *Populus ciliata, Populinirrhiza pinnata, Populinirrhiza khanspurensis*, Ramification, Salicaceae, Himalayan poplar.

Mycopath, 2003 1(1): 99-104

Effect of host species on antimicrobial activity of the ethanolic extracts of *Cuscuta reflexa* Roxb.

Nabeela Anjum and Zaheer-ud-Din Khan*

*Botany Department, Government Islamia College for Women, Cooper Road, Lahore (nabeela662000@yahoo.com) and *Botany Department, Govt. College University, Lahore, Pakistan*

Abstract

The present investigation deals with antimicrobial activity of ethanolic extracts of *Cuscuta reflexa* parasitizing on three different angiospermic hosts.namly *Populus euro- Americana ,Zizphus hysudrica* and *Clerodendron inerme* .The extracts were reported to exhibit significant antimicrobial activity against bacteria like *Pseudomonas aeruginosa , Escherichia coli, Bacillus subtilis* and *Bacillus licheniformis*, and fungi namely *Aspergillus niger* and *Trichoderma reesei.* The results when compared with the inhibition caused by standard reference discs of antibiotics for example Amikacine, Ciprofloxacin and Griseofulvin showed significant differences among three hosts with respect to antimicrobial activity.