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Studies on Survey and Identification of Pathogens Causing Guava (Psidium Guajava Linn.)Decline in Larkana District

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ABSTRACT

Incidence of guava orchards decline was surveyed in different localities of District Larkana. The samples were collected from trees showing clear disease attack. Pure culture was obtained by transferring single spore/ piece of mycelium to PDA plates. Identification was made by using microscopic characters and taxonomical keys. The fungal pathogens responsible for guava orchard decline were fusarium oxysporium f.sp. psidii. and Botryodiplodia theobromae.

Introduction

Guava (Psidium guajava linn) a shallow rooted shrub with spreading branches belongs to Myrtaceae family of Plant Kingdom, which can thrive in both humid and dry climates (Morton 1987). Guava is enrich in vitamin A, B1, B2 and four times high in vitamin C, than those of citrus where as tannins, phenols, triterpene, flavonoids, essential oils, fiber and fatty acids are present (wei et al, 2000) Guava is used for medicinal properties against treatment of diarrhea, gastro enteritis, intestinal worms, gastric disorders, vomiting, cough, vaginal discharges, menstrual pain, hemorrhages and edema (Jaira, etal 1999)

Guava is very productive and highly profitable fruit crop per unit area, the average per hectare guava fruit yield is 9098 k.gs. It starts bearing fruit within shortest possible time(Khan 1985). Guava is grown commercially throughout Sindh, but an excellent flask shaped species with smaller seed core is common in district Larkana (Anonymous 2005)

Successful cultivation of guava is hindered by a number of biotic and abiotic factors Zinc deficiency and high prevalence of disease has been reported (Rehman and Hossain 1989). Disease as obstacle to food values, market price and also threat to germplasm preservation. Pathogenic diseases as wilt anthracnose, fruit rot, phoma rot, rhizopus rot, stem canker, seedling blight, die back and wither tip are commonly reported (Shakir et al 1991).

Very low or no work has been done in this regard especially in Larkana, the commercial guava cultivation area of Sindh. The main object of this study was to survey, observe and collect disease, samples/ specimens for isolation, pure culture and identification of causes of guava decline in district Larkana Sindh.

Material and Methods

Incidence of guava orchard decline was surveyed in commercial guava producing areas of Larkana Sindh. Especially 32 orchards of six locations including Guava Research Station, Chooharpur, Naudero, Mahota, Bakrani, Dokri and Moen jo Daro during April- September 2010.

Samples were collected from trees showing obvious disease symptoms. Specimens comprised, roots, stems, twigs and leaves. Whereas attached soil was also collected in separate polythene bags and brought to laboratory. The samples were stored in cool incubator at 5+1 c^{o} before processing for isolation of associated pathogens.

The specimens were cut into bits and immersed in 1% sodium hypo chloride solution for two minutes then rinsed in sterilized water. Before transferring into Potato dextrose agar (PDA) plates the inoccula was dried with filter paper in order to absorb excess of water present on those. The isolation of causal organism by following the tissue planting method (Hossain, 1989), pure culture was prepared by transferring single spore/ piece of mycelium to PDA plates and identified according to Pathak (1980).

Results and Discussion

Variety of pathogens especially fungi were isolated and during survey of guava orchard decline in different locations of Larkana district. The percentage of fungal pathogens isolated from each locality is given in table below. A total of eight different fungi were isolated. Among these Fusarium oxysporium f.sp. psidii, Botrydiplodia theobromae and Phytopthora parasitica were predominant with mean value of 56.10, 53.19 and 33.51 percent respectively while others recovered were F.Solani f.s.p psidii, Rhozoctonia solani, Pythilum sp. Curvularia and Helminthosporium. The mean isolation frequency of these fungi was 24.86, 18.03, 16.06, 14.18 and 11.90 percent respectively.

The fungi were identified by using microscopic characters and taxonomic keys (Pathak 1980) for each organism/ fungi isolated.

The fungi responsible for guava decline, F.oxysporium f.sp. psidii. B.theobromae phytophthora parasitica were isolated at

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Table 1.Mean percentage value of different fungi isolated form infected Guava plants obtained from six localities of district Larkana Sindh

Organism/ Pathogen Isolated	L1 Chooharpur	L2 Naudero	L-3 Mahota	L-4 Bakrani	L-5 Moen-Jo-Daro	L-6 Dokri	Mean
Fusarium oxysporium f.sp.psidii	70.08	45.50	60.15	49.20	62.40	49.30	56.10
Botryodiplodia theobromae	68.15	48.75	46.40	61.30	51.42	42.15	53.19
Phytophthora parasitica	32.50	31.40	40.14	30.15	25.60	41.30	33.51
Fusarium solani f.sp. psidii	28.70	31.18	19.15	27.30	22.80	19.70	24.79
Rhizoctonia solani	22.60	28.20	20.70	23.15	19.36	18.52	20.08
Pythium spps.	18.90	17.31	16.32	17.21	15.26	11.56	16.09
Curvularia spps.	14.15	12.82	12.23	11.90	12.75	10.36	12.38
Helmintho-sporium spps.	08.07	06.75	05.82	04.73	10.15	09.16	07.55

high rates from different localities. The predominant pathogens, however were F. oxysporum f.sp. psidii and B. theobromae,

Characters of pathogens

i) **F.Oxysporum f.sp. psidii.**

Mycelium: Extensive and cottony in culture with pink, purple or yellow tinge.

Conidiophores: variable, slender and simple or short, branches irregular or bearing a whorl of phialidae, single or groped into sporodochi, conidie, hyaline variable principally of two kinds, often held in a mass of gelatinous material, macro conidia several celled, slightly curved or bent at the pointed end.

Micro conidia:1-celled, avoid or oblong, borne slightly or in chains, some conidia intermediate 02 or 03 celled. Oblong or slightly curved, parasitic on higher plants as well as saprophytic on decaying plant material.

ii)Botryodiplodia therobromae, Pycnidia black, obstacle, erumpent, and somatic. Conidiophores, simple, short, Conidia, dark and 2-celled at maturity avoid to elongate, parasite or saprophytic on twigs. Colony color on PDA, black, growth, rapid with abundant spore production.

iii) **Phytophthora parasitica**

Sporangia develop on acrial hyphae called sporangio spores. Sporangia were terminal and lemon shaped with a distinct papilla. Pathogen has no saprophytic existence in soil and lives as dormant mycelium in host remains lying in soil. The pathogen was a parasitic in nature and attacks under ground parts of plant.

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