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BACTERIAL WILT OF CASSAVA (*Manihot esculenta* Crantz.) IN KERALA

In October, 1975 a bacterial disease was noticed on six month old H-165 variety of cassava grown in two separate plots in the Agricultural College Farm, Vellayani, Trivandrum, Kerala. The incidence of the disease was noted during the rainy season and no further incidence and spread was observed after the cessation of the rains.

Initial symptom of the disease in the field was loss of turgidity of one or two full grown leaves below the growing point. These leaves wilted rapidly and shrivelled. Subsequently all fully opened leaves wilted except the bud leaves. The wilted leaves remained on the plant hanging for some time which later on shed, leaving the stem bare. As the wilting advanced the nonlignified terminal portions of the stem rotted which led to the drying up of the bud. Examination of the stems of wilted plants showed browning of vascular tissues. This browning was more pronounced towards the basal portions. Tubers of affected plants initially showed black discolouration around the necrosed vascular strands and the tubers subsequently rotted completely. Invariably all the tubers of the affected plants rotted in this manner. The rind of the affected tubers remained apparently healthy even after complete rotting of the internal tissues and sometimes produced roots. Bacterial ooze can be readily observed from the cut ends of the stems as well as the tubers of the affected plants.

On isolation, individual colonies of the bacteria became visible on streaks nutrient agar medium after 24 hours, which turned to white grey to cream in colour and were raised, convex, smooth and shiny after 48 hours. On potato dextrose agar the colonies were similar to that on nutrient agar but faster in growth. The colonies on tetrazolium medium were smooth with pink centres and narrow white edges.

Different methods of inoculation were tried using two and a half month old H-165 variety of cassava grown in pots to determine the pathogenicity of the bacterium. Of these, leaf inoculation without injury was found to be the most successful method. Forty eight hour old culture was taken on moist cotton and gently rubbed on the upper surface of the middle leaves. The inoculated plants were kept under shade and covered for 24 hours with moistened polythene bags to provide high humidity. After seven days, initial symptoms of wilt were noted on the inoculated leaves. The symptom development was similar to that observed in the field, but in addition bacterial exudations were noticed on the petioles of wilted leaves. Direct inoculation of the leaves with the bacterial exudation from the diseased tubers in the above manner was also successful.

RESEARCH NOTES

Preliminary studies on varietal resistance were carried out. The varieties tested were M-4, and cultivars locally known as Pannivella, Narungu, Rottivella, Vellakanyan, Manjkoivella and Kukkumuttan, Kannikaruppan, and kaliyan. Of these Pannivella, Narungu and Kannikaruppan showed wilting symptoms alone. In the case of Malayan-4 the only symptom was leaf spotting; other varieties inoculated, showed no visible symptoms even after three weeks.

When one month old tomato seedlings of Marglobe variety were inoculated with 48 hour old culture by leaf axil inoculation method, a gradual and partial wilting was noticed within a period of seven days which was not typical of the bacterial wilt of tomato caused by *Pseudomonas solanacearum* (E. F. Smith) E. F. Smith.

Bradbury (1975) reported that three different bacteria could cause diseases of cassava viz *Xanthomonas manihotis* (Arthaud-Berthet) Starr, *X. cassava* Wiehe and Dawson and *Pseudomonas solanacearum* (E. F. Smith) E. F. Smith. Of these *X. manihotis* can cause a wide variety of symptoms like leaf spotting, blight and wilt. *X. cassava* is a yellow strain causing only leaf spotting. *P. solanacearum* had been reported on cassava and *Manihot glaziovii* Muell. Arg. as causing wilt of young plants.

The present investigations revealed that the symptoms manifested varied with the varieties tested. In Malayan-4 it was leaf spotting, H-165 showed wilting and bacterial exudations from petioles, whereas the other remaining susceptible varieties showed wilting alone.

The symptoms noted above do not completely agree with the bacterial blight of cassava reported by Lozano and Sequeira (1974). But they were similar to the observations of Maraité and Meyer (1975), reporting *X. manihotis* could cause either wilt or blight and leaf spot on cassava and that the nature of symptoms depend on the variety and environmental conditions. Hence, based on the symptomatology and pathogenicity trials, it is likely that the disease under investigation is caused by *X. manihotis*. Further work on the identification of the casual organism and control measures are in progress.

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സംഗ്രഹം

പെള്ളായണി കാർഷിക കോളേജ് ഫാമിൽ നടത്തിയ H-165 എന്നയിനം കർച്ചീനിയിൽ ഒരു പുതിയ ബാക്ടീരിയാരോഗം അടുത്ത കാലത്ത് കാണുകയുണ്ടായി. മുഖ്യരോഗലക്ഷണമായി കണ്ടത് *Xanthomonas manihotis* വാട്ടമായിരുന്നു. കൂമ്പിലുണ്ടായ ഇലകൾ വാടി കൊ

ചീഞ്ഞുപോയതിനെത്തുടർന്ന് കിഴക്കുകരക്കുള്ളിലുള്ള നാളീവൃഹങ്ങൾ കറുത്തും മുറിയ തണ്ടിനകത്തുള്ളവ കടും തവിട്ടു നിറത്തിലും ആയിത്തീർന്നു. കാലക്രമത്തിൽ കിഴക്കുകര ചീഞ്ഞു ഉപയോഗശൂന്യമാവുകയും ചെടി ഒന്നാകെ പട്ടുപോവുകയും ചെയ്തു. മഴക്കാലത്തു മാത്രമാണു ഈ രോഗബാധ കണ്ടതു്.

രോഗലക്ഷണങ്ങൾ കൊണ്ടും രോഗകാരക ബാക്ടീരിയായുടെ ചില സ്വഭാവ വിശേഷങ്ങളെ ആധാരമാക്കിയും സാൻതോമോണാസ് മാനിഹോട്ടിസ് എന്ന ബാക്ടീരിയ ആണു് രോഗ ഹേതുവെന്നു് കരുതുന്നു.

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