

MANIHOT CAERULESCENCE : A NEW SOURCE OF RESISTANCE TO CASSAVA MOSAIC DISEASE



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INTRODUCTION

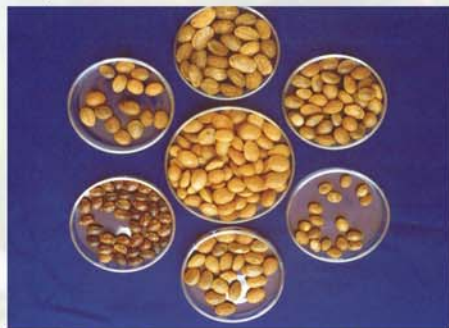
Cassava is a subsistence crop, which provides high calorific value throughout the developing world. In India cassava occupies 0.26 million hectares producing 5.87 million tons annually. Cassava Mosaic Disease (CMD) is the most important problem of this crop in India leading to 16-80 per cent yield loss depending on the stage of infection. The present study was conducted to identify and transfer new sources of resistance from wild *Manihot* species for evolving breeding lines having CMD resistance.

MATERIALS AND METHODS

Seeds of *Manihot* species received from EMBRAPA, Brazil were raised in Central Tuber Crops Research Institute (CTCRI) farm and used for interspecific breeding programme. Thirty seven accessions comprising of *Manihot glaziovii*, *M. pseudoglaziovii*, *M.caerulescence*, *M.tristis*, *M.esculenta* var *peruviana* and *M. esculenta* var *flabellifolia* were screened for CMD resistance. Wedge grafting was used for the confirmation of resistance expressed by the interspecific hybrids. Young infected plants of 6 weeks were used as rootstock. Shoot tips from symptom free plants were grafted on highly infected cassava rootstocks.

RESULTS AND DISCUSSION

Wild species were crossed with elite cassava varieties at different time intervals from 8.30 am to 12.30 am. Viable hybrid seeds were produced with maximum seed setting (82.0%) in *M.tristis* and minimum in *M.caerulescence* (4%).



Out of 1056 interspecific hybrids produced, 147 showed tuber formation of which 35 were completely free from symptoms produced by Indian cassava mosaic virus. The interspecific hybrids with *M.tristis* and *M.glaziovii* expressed low to medium CMD symptoms whereas the interspecific hybrids of *M.caerulescence* did not express any symptoms.

Interspecific hybrid : *M. caerulescence* x *M.esculenta*



M.glaziovii was used as the main source of resistance to African cassava mosaic disease (ACMD). Resistance to ACMD was identified in the third backcross progeny of an interspecific cross between cassava and *M.glaziovii* (Akano et al., 2001). Cours et al., (1997) also reported high level of resistance in *M.glaziovii*. However in the present study, *M.glaziovii* was found to be susceptible to Indian cassava mosaic disease while *M.caerulescence* and its interspecific hybrids exhibited immunity reaction confirmed through grafting. Bud grafting was reported to be useful to differentiate between field response and immunity to virus infection (Ogbe et al., 2001). Present investigation revealed wedge grafting of the resistant scions on highly infected root stock, as a useful technique for artificial screening.

Grafting Test



Tuber Variation



Tuber formation was not observed in 66 percent of the backcross population. Fifty four clones were found to be completely symptom free and were backcrossed to improve root quality. The interspecific hybrids had high cyanogenic content (209.6 $\mu\text{g}/100\text{g}$) while its backcross progenies recorded a lesser cyanogen content (13.13 to 145.23 $\mu\text{g}/100\text{g}$). The backcross hybrids recorded starch content ranging from 20.45% to 31.25%. The study showed that *Manihot* species could be used as source of resistance for evolving ICMD resistant breeding lines in cassava.

CONCLUSION

The study identified *M.caerulescence* as a new source of resistance to Indian cassava mosaic disease. The genetic nature of inheritance needs further investigation.

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