ABSTRACT

Genetics of Resistance to Cowpea Severe Mosaic Virus (Trin. Isol.) and some important Agronomic Characteristics in *Vigna unguiculata* (L.) Walp.

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A series of investigations were conducted to study the genetics of resistance to Cowpea Severe Mosaic Virus (CSMV) and some important agronomic characteristics in cowpea (*Vigna unguiculata* L. Walp.). The aim of this research was allied to an on going breeding programme at the University of the West Indies to develop vegetable cultivars of cowpea immune to CSMV coupled with adaptability to humid tropical conditions.

Resistance to the Trinidad isolate of CSMV was found to exist in the form of immunity, tolerance and 'resistance'. The virus isolate endemic to Trinidad appears to be more aggressive and virulent than isolates from the Americas and other parts of the Caribbean.

The genetic studies revealed that the mode of inheritance of host reaction to the pathogen was determined primarily by three major genes acting in a gene dosage dependent manner. Genetic models for various forms of host response such as immunity, tolerance, resistance and susceptibility are presented. Minor gene influence and modifier gene action were also observed in some genotypes. A screening procedure for detecting delayed symptom expression was developed and was used effectively, in these studies.

Cultivar response to short term waterlogging was assessed in pot studies. Genotypic variability for nodulation and nodule adaptation were found in treatments stressed during the vegetative phase. These reflected themselves in the extent of chlorosis, recovery rates and recovery time.

All cultivars recovered considerably provided the extended vegetative and reproductive periods were accommodated. Prolonged waterlogging throughout the life of the crop adversely affected all cultivars. The branching habit appears to influence the exent of damage under such conditions. Waterlogging during the reproductive phase appears to advance senescence in cultivars with poor root tolerance.

Genetic components of variance, heritability estimates and combining ability estimates are reported for yield components and pod quality traits of vegetable cowpea. There is a paucity of such information in the literature.

The thesis also discusses artificial hybridization techniques with respect to increasing podset, and breeding strategies for incorporating CSMV resistance and yield improvement.