Serological studies of mung bean mosaic virus (MBMV)

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Abstract: An experiment was conducted during 2010-11 to see the serological reaction for identification of mung bean mosaic virus (MBMV). It is the causative of mosaic, mottling, chlorosis, necrosis, vein-banding symptoms in mung bean plants. The affected plants become weak, stunted and reduced in size. The serological test with the range of known viruses indicate that the sap obtained from healthy and infected test plant gave no precipitin test.

Key words: Serology, Identity, Mung bean, Symptom, Precipitin test, NaCl, HgCl₂

Introduction

Mung bean (Vigna radiata L.) commonly called green gram has known by several vernacular names in different parts of India. It is one of the most important pulse crop grown in almost all states for about 3000 years. It is now spreading in other countries like Asia and Africa. At present time, the crop is grown in about 3000 million hectares and the total annual production is about 1.1 million tones. The important mung growing states are UP, MP, Bihar, Maharashtra, Rajasthan, AP, Tamil Nadu and West Bengal.

Viruses are minute, parasitic, microscopic, submicroscopic, obligate parasite having RNA or DNA as the genetic material enclosed by protein coat and are capable of self replicating only inside the living host.

More than half of all known viruses causes disease in plants than animals. MBMV is more prevalent and causes great damage to mung bean crop. Present investigation have been proposed to find out the nature, identity, mode of infection and metabolic disturbances caused by the virus mentioned in the title.

Various symptoms on mung plants, observed during course of study period. Natural infected plants are stunted and weak, vein clearing of young leaves followed by mild chlorosis. To established the identity of viruses occurring on mung bean, experiments were carried out to determine the host range, physical properties mode of transmission, cross protection test and serological relationship with the range of known viruses.

Serological test is important in the identification of plant viruses due to its high susceptibility and quick result.

Materials and Methods

The host plant for research work is taken to be mung bean (Vigna radiata L.). The cultivated variety of Mung bean is selected to be Pant Mung-1 obtained from Narendra Dev University of Agriculture and Technology Kumarganj, Faizabad. The seeds are treated with 0.1 percent HgCl₂ and washed with tap water and dried in shade. Plants were grown in clay pots containing sterilized sand-loam and compost under insect proof chamber.

The virus MBMV isolated from naturally infected mung bean plants growing in field. The virus culture was transferred to young healthy mung bean c. v. pant mung-1 at frequent inoculation.

Result and Discussion

Now a days serology technique is widely used to determine the relationship between different viruses as well as their control. Plant virus serology has been reviewed by several workers from time to time such as Chester, 1937a, b; Bawdon, 1950, 1964; Slogteven, 1955, 1957; Matthew, 1957, 1967, 1970; Ball, 1961, 1964; Berck et al., 1972.

A number of methods of Serological test are known for identification of plant viruses, among them, most widely accepted method is the tube precipitin test because require little equipments and result is too easy to interpret. For precipitin test, 1:4 and 1:16 dilutions of the infective and healthy saps were used against similar dilutions of antisera.

Observations indicated that sap obtained from healthy and infected mung bean c. v. pant mung-1 gave no precipitin test. It reveals the MBMV is not related with any other virus whose antisera
is used. Reviewed literature of Dvorak (1927), Bawdon (1950), Matthew (1970), Ball (1964), Berck et al., (1972) had similar findings but the degree of impact of MBMV varies with different antisera.

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References


