

Effect of plant variety and infection age on the presence of three mosaic viruses in the seeds of cowpea [*Vigna sinensis* (L.)]

GUNJAN GUPTA¹, MONI SINGH¹, MADHVI PATHAK² AND J.P. TEWARI^{1*}

¹Department of Botany, M.L.K.(R.G.) College, BALRAMPUR (U.P.) INDIA

²Department of Botany, Kisan (P.G.) College, BAHRAICH (U.P.) INDIA

(Accepted : June, 2008)

SUMMARY

Seedlings of highly susceptible cowpea cvs. Pusa phalguni, Pusa dofassali, C-152 and C-20 were sap inoculated with cowpea aphid-borne mosaic virus (CPABMV), black-eye cowpea mosaic virus (BECPMV) and cowpea mosaic virus (CPMV). Seeds from infected plants were collected and grown in steam sterilized soil. Presence of Virus was assayed in the plants raised from these seeds. When plants of different age were inoculated with these viruses an inverse relationship in the per cent seed transmission and age of plant was found. One week old plants were most prone to seed transmission. All these viruses were carried in the seeds when three weeks old plants were inoculated. When six weeks old plants were inoculated, no visible symptoms of any viruses were observed.

Key words : Cowpea, CPABMV, BECPMV, CPMV, Crop yield.

Cowpea (*Vigna sinensis* L.) constitutes one of the most important pulse crops of the world. In India, cowpea is mainly cultivated for fodder, green manure and soil improving cover crop. Green pods and seeds of cowpea are used as vegetables. In plains, cowpea is grown in summer and rainy seasons, where as on higher elevations in summer. Different manifestations of mosaic are commonly observed on cowpea crops in eastern Uttar Pradesh (Nain. *et. al*, 1994). Seed-borne viruses particularly in the natural conditions cause serious losses in cowpea seed yield and crop health. (Khun, 1990). In addition, they are the potential sources of infection right from the germination and the reduction in yield is much higher. In view of the above facts, a comprehensive study was undertaken to find out the effect of three virus infections at different physiological stages of cowpea plants as seen by the seed transmission of the viruses.

MATERIALS AND METHODS

Seeds of four highly susceptible cultivars *viz.*, Pusa Phalguni, Pusa Dofassali, C-152 and C-20 were used in the experiment. The seedlings were raised in an insect proof green house. Three replications of each treatment were taken. The youngest expanded trifoliolate leaves of one, three and six weeks old plants in batches of twenty each were sap inoculated with cowpea aphid-borne mosaic virus (CPABMV), Black-eye cowpea mosaic virus (BECPMV), cowpea mosaic virus (CPMV) and maintained till maturity. An additional batch of twenty healthy plants of these cultivars in each case inoculated with healthy sap served as control. Seeds from infected

plants of each batch were harvested at maturity and two hundred randomly selected seeds from each pot were grown in steam sterilized soil and observed for four weeks after germination. Plants showing symptoms were countered in each group and presence of the virus was further confirmed by back inoculation test.

RESULTS AND DISCUSSION

One, three and six weeks old plants of all cvs. when inoculated with the 3 seed-borne viruses *viz.*, CPABMV, BECPMV and CPMV both one and three weeks old plants showed mosaic symptoms but in case of six weeks old plants did not show any visible symptoms of any virus upon inoculation. In six weeks old plants of all cvs., the per cent seed transmission was significantly lower as compared to one and three weeks old plants (Table 1).

The data presented in the Table 1 also indicate that per cent seed transmission was significantly higher when one week old plants of all cultivars were sap inoculated with CPABMV (24.46%) compared to BECPMV (18.33%). Where as in CPMV, the per cent seed transmission was significantly lower *i.e.* 2.72%. The analysed data showed that susceptibility of cv. PUSA PHALGUNI to seed transmission was significantly higher than that of cv. C-20.

In case of three weeks old plants, per cent seed transmission of all the three viruses was significantly quite lower than in one week old plants. Per cent seed transmission was significantly higher when three weeks old plants of all the cvs. were sap inoculated with CPABMV (16.17%) compared to BECPMV (10.37%)

* Author for correspondence.