

# Periodic Research

## Affected Seed Development of Bottle Gourd (*Lagenaria Siceraria* Standl.) Plant Infected With CMV And WMV

Development of flowers and production of fruits and seeds was adversely affected by Watermelon mosaic virus (WMV) and Cucumber mosaic virus (CMV). The damage was more severe by WMV than CMV infection. Most of the seeds in mature fruits of WMV infected plants never reached maturity, thus reducing their number quite significantly.

Seed formation in virus infected plants is mostly adversely affected. It is independent of weather. The virus is present in the seed or is transmitted through it. Quality and Quantity of seeds of virus diseased plants depend on the development and quality of fruits. It is generally seen that healthy plants bear well developed fruits that ultimately produce good number of seeds with normal size and shape. While fruits developed on diseased plants were inferior in quality because of plant produce sub normal number of seeds with inferior quality. Cucumber mosaic virus and Watermelon mosaic virus also reduced poor development of such fruits bear lessor number of seeds, sometime not properly developed and some times seeds extent in fruits

**Keyword:** Cucumber Mosaic Virus (CMV), Watermelon Mosaic Virus (WMV).

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### Introduction

The fruits of bottle gourd (*Lagenaria siceraria* Standl) of cultivated types vary in shape and size and have been given different names e.g.- bottle gourd, trumpet gourd, tumeri, lauке, etc.

*Lagenaria siceraria* is a popular vegetable grown almost all the year round in the plains of India while its cultivation is limited to summer and rains in the hilly areas. It can be cultivated in all kinds of soils, but thrives best in heavily manured loams. It requires warm humid climate. Generally three crops of this vegetable are raised in India. The winter crop is sown from the middle of October to mid December, the summer crop from mid January to mid March and the rainy season (Kharif) crop. is sown from middle of March to middle of July. The vines are either allowed to trail on the ground or trained over walls, tree thatch or roof or other support.

Bottle gourd as vegetable has tremendous nutritive value because of indispensable mineral salts, carbohydrates and vitamins. The fruit is a rich source of vitamin-B, ascorbic acid, thiamine, riboflavin, niacin and pectin. It constitutes an easily digestible vegetable and therefore, is prescribed as diet for the patients. The fruits and seeds contain almost all important amino acid. Viz: leucine, phenylalanine, valine, tyrosine, alanine, threonine, glutamic acid, serine, aspartic acid, cystine and proline.

The fruits pulp around the seeds is considered emetic as well as purgative. It is cooling, diuretic and antibilious and is applied externally in delirium. A syrup prepared from the tender fruit is used as pectroal. The juice of the fruit mixed with lime juice is used as medicine to cure pimples, and when boiled with oil, it is used to treat baldness. The mature seeds are boiled in salt water and eaten as appetizer in China.

Bottle gourd occupis much more important in the hills of Uttarakhand. This crop is becoming more and more popular among the villagers as a good source of income as well. The poor inhabitants of these areas who have small pieces of cultivable land prefer to cultivate cash crop like bottle gourd instead of food grains generally, bottle gourd is becoming one of the principal and commonly cultivated vegetables both for personal consumption as well as commercial purpose. Even the villagers who have least agricultural land can easily cultivate this crop and earn money to fulfill some of their basic needs.

Bhargava, B.(1977) worked on effect the WMC on the yield of *Cucurbita pepo*. Thomas, W (1973) worked on how the virus was transmitted to other cucurbits through seeds. 287 seedlings grown from the imported seeds. Chohan (1973) have reported Cucumis virus-3 which was transmitted through seeds of Cucurbits.

Quality and Quantity of Seeds of virus infected plants depends on the development and quality of fruits they bear. Fruits developed on infected plants are inferior in quality because of their poor development. Such fruits bear lesser number of seeds, some times not properly developed. Watermelon mosaic virus affected the seed formation more severely than Cucumber Mosaic virus. Most of the seeds in mature fruits of WMV infected plants never reached maturity, thus reducing their number quite significantly.

### Material and Methods

Mostly there has been a substantial qualitative and quantitative decrease in the yield and productivity of crops infected with viruses. Generally it has been seen that seed development of virus-infected plants in adversely affected. It is independent of weather the virus is present in the seed or is transmitted through it.

To study the effect of CMV and WMV on seed formation of bottle gourd, three lots of two plants each were taken respectively. The plants are allowed to grow and develop into virus and sprayed with an insecticide at regular intervals. Observations were taken at four intervals. The fruits were allowed to mature. On maturation two fruits from each lot (healthy, CMV and WMV infected) were harvested to collect their seeds. Number and weight of seeds of healthy as well as diseased fruits were recorded. Seed for healthy and infected fruits of each isolate were collected, sun dried, counted and finally weighed separately.

It is generally seen that healthy plants bear well developed on diseased plants are ill developed and produce sub-normal number of seeds with inferior quality.

### Results

Generally fruits and seeds development in virus infected plants is adversely affected as compared to those of healthy plants. In the present observation CMV as well as WMV affected the number, size and shape of fruits causing significant yield loss.

Qureshi and Mayee (1979) observed, viruses was easily transmissible through aphides and seeds. Verma and Verma (1979) worked on how virus can be transmitted mechanically as well as by aphides. Ainsworth, C.G. (1930 Sa) give details of the mosaic diseases of the cucumber.

Two hundred twenty one fully developed seeds were collected from four fruits of healthy plants. Same number of fruits from CMV infected plants could produce only 150 seeds indicating 32.12 percent reduction. Seed production was still poor in the fruits of WMV infected plants. Total count of seeds from 4 fruits was only 53 (76.02% reduction).

CMV and WMV also reduced the weight of seeds to some extent. Weight of 100 healthy seed was measured to be 23.93 gm. While seeds collected from the fruit of CMV and WMV infected plants weighed 19.815 gm and 19.065 gm respectively. Infection with CMV reduced the weight of seeds by 17.24% while 20.33% reduction was recorded in case of seeds obtained from the fruits of WMV infected plants.

### Discussion

Generally, present observations indicate the CMV and WMV affected the number, size and shape of fruits causing significant yield loss.

CMV infected virus developed normal number of flowers but only a few of these developed fruits. Fruits on such virus were much smaller in size than those of healthy virus. Such fruits had rough skin, some times showing mosaic mottling, percentage yield loss varied from 50%-75%.

WMV infected virus showed more significant reduction in yield varying from 75%-100% flower abortion has been a common phenomenon with WMV infected virus. The fruits remained much smaller in size. Such fruits showed patches of dark and light green colour on their skin. Severely infected plants produced fruits with blisters of dark green colour.

Fruits developed on infected plants were inferior in quality because of their poor development. Such fruits bear lesser number of seeds, sometimes not properly developed.

Results obtained in the present experiment-show that seed production has been adversely affected by both the viruses. However WMV affected the seed formation more severely than CMV most of the seeds of WMV and CMV also reduced the weight of seeds. Infection with CMV reduced weight of seeds by 17.24% while 20.33% from the fruits of WMV infected plants.

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