

## Effect of plant extracts on the infectivity of Groundnut Mosaic Virus (GMV) *in vitro*

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### Abstract

Certain plant extracts are known to exhibit antiviral properties. In the present study eight plant extracts were tried on Groundnut mosaic virus, known to damage groundnut plants, thus leading to severe financial loss to farmers. Out of eight extracts tested in the present study, only four extracts behaved as potent virus inhibitors (49-63%). Of the remaining four, three showed 22-31% inhibition of the virus and one showed phytotoxic effect on the indicator host.

**Key words:** *Arachis hypogaea* L., Groundnut Mosaic Virus (GMV).

**G**roundnut (*Arachis hypogaea* L.) is an economically important and widely cultivated crop. It is one of the most common oil seed & food crop in India. Roasted and salted peanuts are used as snacks or constituents of various Indian recipes, besides preparation of peanut butter. Peanut is a very nutritious food. Its filtered refined oil is used for cooking and the remaining part is made in to the oil cake which is used as fodder. Protein in peanuts is used in the manufacture of ardil, a synthetic fiber. The mosaic disease of groundnut is characterized by appearance of light yellow patches intermingled with dark green areas on young apical leaves which later on develop chlorosis, vein clearing with appearance of occasional rings. In severely affected plants, stunting is noticed due to

shortened internodes. In this disease reduction in number & size of leaflets is also observed. The paper elucidates the effect of plant extracts on the infectivity of Groundnut mosaic virus (GMV).

In order to study the effect of plant extracts on groundnut mosaic virus, seeds of *Argemone mexicana*, *Solanum xanthocarpum*, *Oryza sativa*, *Datura stramonium*, Bulb of *Allium cepa*, Phylloclade of *Opuntia tuna*, Leaves of *Ocimum sanctum* and *Eucalyptus paniculata* were selected. The seeds of *Argemone mexicana*, *Solanum xanthocarpum* and *Datura stramonium* were collected from wild plants while that of *Oryza sativa* were purchased from commercial market. The required parts were collected, thoroughly

Table-1. Effect of mixing plant part extracts with standard virus inoculum *in vitro*.

S. No.	Source of plant part extract	Number of lesions per 20 leaves		% inhibition
		Control	Treated	
1	Seeds of <i>Argemone mexicana</i>	179	73	59.22
2.	Seeds of <i>Solanum xanthocarpum</i>	181	141	22.10
3.	Seeds of <i>Oryza sativa</i>	182	140	23.08
4.	Seeds of <i>Datura stramonium</i>	176	121	31.25
5.	Phylloclade of <i>Opuntia tuna</i>	173	Phytotoxic effect	Nil
6.	Bulb of <i>Allium cepa</i>	174	65	62.64
7.	Leaves of <i>Ocimum sanctum</i>	176	77	56.25
8.	Leaves of <i>Eucalyptus paniculata</i>	182	92	49.45

washed with distilled water and crushed for preparation of extracts. The seeds, however, were first soaked for 36-48 hours so as to make them soft and then finally crushed in distilled water for preparation of extracts. The extracted juice was centrifuged at 3000 rpm for 30 minutes and the clear aliquot was used for further experimentation. Equal amount of standard virus inoculums and extracts were mixed separately and incubated for 30 minutes at room temperature 25 ( $\pm 2^\circ\text{C}$ ) and then inoculated on indicator host. Corresponding controls were also maintained in which inoculations were made with virus extract mixed with equal amount of distilled water.

Percentage inhibition was calculated by the formula as given under:-

$$\text{Percentage Inhibition} = 100 - \frac{\text{Number of lesions produced by Inoculum containing inhibitor}}{\text{Number of lesions produced by control Inoculum}} \times 100$$

Results are presented in Table-1. It is observed that out of 8 extracts tested, the seed extract of *Argemone*, Leaf extract of *Ocimum* & *Eucalyptus* and bulb of *Allium* gave 49-63% inhibition of the virus. It means that only four extracts behaved as potent virus inhibitors. Out of the remaining four extracts, seed extracts of *Solanum*, *Datura* & *Oryza* gave only 22-31% inhibition of the virus while phylloclade of *Opuntia* showed phytotoxic effect on indicator host. Study demonstrates that plant part extracts are found to inhibit the plant virus. Similar results of inhibition have been noticed by other authors<sup>1-10</sup>. Hence, from *in vitro* experiments conducted under present study it can be concluded that, out of eight, four plant extracts could be used to give direct protection to the crop against virus infection.

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