Phyton (Austria)	Vol. 14	Fasc. 3–4	309–311	28. I. 1972

Observations on a virus Disease of *Salvia splendens* occurring in Gorakhpur

By

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Introduction

Salvia (*Salvia splendens* KER-GAWL.) is a popular ornamental plant in public and private gardens of Gorakhpur. Since last few years a mosaic disease of salvia is very common in these gardens. The affected plants show abnormal light green spotting on the leaves. The disease starts as vein clearing when plants are few weeks old. This is soon followed by the appearance of light green spots which afterwards enlarge to form bigger patches and finally giving the leaf a mosaic pattern. In severe form the leaves are distorted. Such affected plants are weak, dwarfed and bear a few small unattractive flowers. A preliminary test showed that a virus is involved in this disease.

Materials and methods

To get pure culture of the causal virus, an extraction from naturally infected salvia plant was inoculated on *Nicotiana tabacum* 'White Burley'. A continuous culture of the virus was maintained on the same variety of tobacco by mechanical inoculation. The standard extract used for all experimental purposes was prepared by adding 1 ml. of double distilled water for every gram of leaf tissue used for extraction of sap. All sap inoculations were made by usual rubbing method using 600 mesh carborundum powder as abrasive.

Results and discussion

Transmission of the disease: The virus is easily transmissible by mechanical sap inoculation. It is also transmitted by two aphids *Myzus persicae* SULZ. and *Aphis gossypii* GLOV. This virus is of non-persistent type and can be acquired by the vectors in short feeding period.

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Host range: All the test plants were raised in 4 inches pots filled with sterilized soil inside insect proof glass house. These plants were inoculated in 3—4 leaf stage by rubbing leaves using diseased sap and kept under observation for a period of two months. Plants that did not show any visible syptoms were indexed on haelthy *Nicotiana tabacum* 'White Burley' plants to find out if were carrying the virus symptomlessly.

The virus was successfully transmitted to the following plants: *Capsicum annuum* L., *Cucumis sativus* L., *Cucurbita pepo* L., *Datura metel* L., *D. stramonium* L., *Melilotus alba* MEDICUS, *Nicotiana tabacum* L. 'White Burley', *Physalis peruviana* L., *Salvia plebeia* R. BR., *S. splendens* KER-GAWL., *Solanum melongena* L., *S. nigrum* L., *Trifolium repens* L., *Vigna sinensis* SAVI, *Vinca rosea* L. and *Zinnia elegans* JACQ.

The virus did not infect the following plants: *Beta vulgaris* L., *Brassica campestris* L. 'Sarson', *B. oleracea* L. var. *capitata*, *B. oleracea* L. var. *botrytis* L., *Chenopodium amaranticolor* L., *Coriandrum sativum* L., *Glycine max* (L.) MERRILL, *Gomphrena globosa* L., *Lycopersicum esculentum* MILL., *Phaseolus mungo* L., *P. radiatus* L., *P. vulgaris* L., *Petunia hybrida* VILM., *Pisum sativum* L., *Raphanus sativus* L., *Saccharum officinarum* L., *Triticum vulgare* VILL., *Trigonella foenum-graecum* L., and *Tropaeolum majus* L.

Physical Properties: The physical properties of the virus were tested by the usual methods on *Nicotiana tabacum* L. 'White Burley' test plants. The virus had the following properties 'in vitro':

Tolerance to dilution — between 1:10,000 to 1:100,000
Resistance to heat — between 60 to 70° C
Longevity 'in vitro' — between 24 to 48 hrs. at 30—35° C.

GARDNER, TOMPKINS & WHIPPLE 1935 recorded *Salvia* sp. as the host of tomato spotted wilt in California. FULTON 1941 was successful in recovering tobacco ringspot from *Salvia splendens* KER-GAWL. Four species of *Salvia* were found as host of tobacco mosaic virus by HOLMES 1946, while a graft transmissible virus was observed in *Salvia splendens* KER-GAWL. in Belgium by ROLAND 1950. Cucumber mosaic virus was reported on *Salvia patens* CAV. by FAAN & JOHNSON 1951. A graft transmitted chlorosis of *Salvia coccinea* L. was recorded in India by VERMA & BOSE 1955. From Florida ANDERSON 1959 observed *Salvia lyrata* L. as host of cucumber mosaic virus.

The symptoms produced on differential hosts and physical properties of the virus under study are in general agreement with those of cucumber mosaic virus. This is the first record of a mosaic disease of *Salvia splendens* KER-GAWL. caused by cucumber mosaic virus in this country.

Salvia plebeia R. BR. a perennial weed grows in abundance adjacent to gardens of Gorakhpur. This plant is noticed to harbour cucumber mosaic virus throughout the year and might be acting as potential soucre of

infection. It is suggested that destruction of affected *Salvia plebeia* R. Br. adjacent to gardens might reduce the incidence of this disease.

Acknowledgements

The authors are grateful to Prof. K. S. Bhargava, Head of the Botany Department for encouragement and providing the necessary facilities. They are thankful to U. G. C. for financial assistance.

Summary

A mosaic disease of *Salvia splendens* Ker-Gawl. has been observed in the public and private gardens of Gorakhpur. The affected plants are weak, dwarfed and bear few small flowers. The causal organism was identified as cucumber mosaic virus. A perennial weed *Salvia plebeia* R. Br. was recorded as potential source of infection. Its destruction near the gardens has been suggested as possible measure for controlling the disease.

Zusammenfassung

In öffentlichen und privaten Gärten von Gorakhpur wurde das Auftreten von mosaikkranken *Salvia splendens* Ker-Gawl.-Pflanzen beobachtet. Die infizierten Pflanzen werden kränklich, bleiben im Wachstum zurück und entwickeln nur wenige, kleine Blüten. Als Ursache wurde das cucumber mosaic virus festgestellt. Als mögliche Infektionsquelle wurde die perennierende *Salvia plebeia* R. Br. ermittelt. Deren Vernichtung in der Nähe von Gärten wird als eine empfehlenswerte Maßnahme vorgeschlagen, um die Krankheit einzuschränken.

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