BIOLOGIA PLANTARUM (PRAHA)

6 (3) : 238—239, 1964

BRIEF COMMUNICATION

Preservative Effect of Saccharose Solution on Some Plant Viruses

ZDENKO POLÁK

Department of Plant Pathology, Institute of Experimental Botany,
Czechoslovak Academy of Sciences, Praha*

Received February 11, 1964

The influence of saccharose on the retention of infectivity of some plant viruses was first recorded by HANSEN (1954). He found that the infectivity of some viruses was prolonged both by storing detached leaves of virus infected plants in concentrated saccharose solution and by the saturation of crude infectious sap with saccharose. Hansen tested the following viruses in detached leaves: potato virus Y, potato virus X, tobacco mosaic virus and tobacco stripe- and curl disease virus All viruses in detached leaves put into saccharose solution were successfully preserved during seven or nine month's storage. In 1950 BERCKS succeeded in preserving potato virus X in clarified expressed infectious sap mixed with glycerine. But his experiments with potato virus Y were not satisfactory.

We investigated normal and necrotic strains of potato virus Y, potato virus X, two common and one yellow strain of cucumber mosaic virus (CMV), cabbage black ringspot virus (CBRV) and the complex of CMV and CBRV, sugar beet mosaic virus (BMV) and tobacco rattle virus

Table 1. Infectivity of leaf homogenates after storage of infectious leaves in 3m saccharose solution

Virus	Plant species used for preservation and further application of the virus	Results of repeated experiments in four-year period a = Storage in saccharose solution (in months) b = Number of plants infected out of ten plants tested							
		1960		1961		1962		1963	
		a	b	a	b	a	b	a	b
Potato Y	*Nicotiana tabacum* L.	8	6	7	6	7	10	7	10
Potato Y necrotic	*Nicotiana tabacum* L.	—*)	—*)	8	7	8	8	—	—
Potato X	*Nicotiana tabacum* L.	8	3	—	—	—	—	—	—
CMV common	*Nicotiana tabacum* L.	8	2	7	4	8	5	7	5
CMV common	*Nicotiana tabacum* L.	—	—	—	—	7	9	7	7
CMV yellow	*Nicotiana tabacum* L.	—	—	7	0	7	0	7	0
TRV	*Nicotiana tabacum* L.	—	—	—	—	—	—	8	10
CBRV	*Nicotiana glutinosa* L.	—	—	7	2	10	2	7	3
CBRV + CMV	*Nicotiana glutinosa* L.	—	—	8	3	7	2	—	—
BMV	*Beta vulgaris* L.	—	—	—	—	12	4	7	3

*) — = not tested

* *Address*: Na Karlovce 1, Praha-Dejvice

Table 2.

Virus	Plant species used for preservation	2m saccharose solution		5m saccharose solution		Storage in saccharose solution (in months)
		Number of plants infected out of ten plants tested				
Potato Y	*N. tabacum* L.	0	0	1	1	7
CMV common	*N. tabacum* L.	0	0	0	1	7

(TRV). Except for the yellow strain of CMV, all viruses and virus strains tested "survived" in their host leaves submerged in saccharose solution as indicated in Table 1.

Our investigations showed that 3m aqueous saccharose solution gave the best results. (The concentration of solutions used is given in molality — m; the number of mols was dissolved in 1,000 g. of the solvent.) The detached leaves of infected plants were put into 50 ml. Erlenmayer flasks (three younger leaves with expressive symptoms of the disease were put into one flask); the flasks were then filled with saccharose solution and corked. The flasks were stored in a refrigerator at a temperature below zero until required. No antiseptic was added.

Inoculum from treated leaves was prepared by homogenization of the leaves in necessary amount of distilled water, after thorough washing in distilled water and drying on filter paper. Leaves of inoculated plants were washed in running tap water after rubbing. A set of 10 plants was used for each inoculation. Two leaves of each plant were inoculated. Results of infectivity tests are shown in Table 1.

Other concentrations of saccharose solution tested did not give satisfactory results as follows from Table 2.

References

HANSEN, H. P.: The influence of saccharose on infectivity and physical properties of some plant viruses. — Contr. Dept. Plant. Path., Copenhagen **39** : 18, 1954.

BERCKS, R.: Über die Konservierung von Kartoffel-X-Virus durch Glycerin. — Phytopath. Ztschr. **16** : 508—510, 1950.

ZDENKO POLÁK, oddělení fytopatologie Ústavu experimentální botaniky Československé akademie věd, Praha: **Konservační účinek roztoku sacharózy na některé rostlinné viry.** — Biol. Plant. 6 : 238—239, 1964.

Konzervaci virů jsme prováděli v oddělených listech infekčních rostlin, které byly ponořeny do roztoku sacharózy. Nejlepšího výsledku jsme dosáhli s 3molálním roztokem. Takto byly úspěšně konzervovány: obyčejný a nekrotický kmen Y viru bramboru, X virus bramboru, 2 zelené kmeny viru mozaiky okurky, virus černé kroužkovitosti zelí, komplex viru mozaiky okurky a viru černé kroužkovitosti zelí, virus mozaiky řepy a virus nekrotické kadeřavosti tabáku. Průměrná doba uložení listů v roztoku sacharózy byla 7—8 měsíců. Tímto způsobem se však nepodařilo konzervovat žlutý kmen viru mozaiky okurky.

З. ПОЛАК, отделение фитопаталогии, Институт экспериментальной ботаники ЧСАН, Прага: **Консервирующее действие раствора сахарозы на некоторые растительные вирусы.** — Biol. Plant. 6 : 238—239, 1964.

Вирусы были консервированы в отделенных листьях инфекционных растений, которые были погружены в раствор сахарозы. Самый лучший результат мы получили применением 3-хмоляльного раствора сахарозы. Таким образом были успешно консервированы следующие вирусы: обыкновенный и некротический штаммы *Y* вируса картофеля, *X* вирус картофеля, два обыкновенных штамма вируса огуречной мозаики, вирус черной кольцевой пятнистости капусты, комплекс вируса огуречной мозаики и вируса черной кольцевой пятнистости капусты, вирус мозаики свеклы и вирус курчавой полосатости табака. Листья были уложены в растворе около 7—8 месяцев. Этим методом не удалось консервировать желтый штамм вируса огуречной мозаики.