

Comparative pH determinations of buffer solutions

Temperature of solutions — 20–22°C.	
pH by	
Micro glass electrode	Standard glass electrode
3.97	3.98
4.64	4.63
4.58	4.60
4.59	4.59
5.58	6.00
6.89	6.89
7.69	7.70
9.27	9.26
8.69	8.70
2.35	2.35
3.11	3.12
4.23	4.25
5.47	5.45
6.64	6.63
7.94	7.93
9.11	9.12
10.24	10.24

Cleaning of glass electrode cup did not present any difficulty. A small piece of cotton-wool or soft filter paper was introduced to absorb the liquid and the cup was washed 2-3 times by directing a thin jet of distilled water on the end of the KCl-bridge and opening the stop-cock for a moment to flush out the end of the bridge. Once the electrodes were adjusted no need was felt for disturbing their relative positions thus ensuring the safety of the glass membrane. A thin layer of liquid paraffin on the surface of the solution has been found to prevent evaporation quite satisfactorily.

The glass electrode was tested thoroughly by using various standard buffers. The results were compared with those obtained by the standard glass electrode. There is a close agreement between the pH values determined by the micro-glass electrode and also by the standard glass electrode.

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December 9, 1946.

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A NOTE ON MOSAIC VIRUS OF SANN-HEMP (*CROTALARIA JUNCEA* LINN.) AND ITS CRYSTALLISATION

A MOSAIC disease of sann-hemp (*Crotalaria juncea* Linn.) was found to be of widespread occurrence during the early part of 1946 at Delhi.

The first visible symptom of the disease is mottling of the leaf. As the disease progresses patches of light and dark-green areas become more prominent. A diseased leaf is much smaller than a healthy one (Fig. 1); in the case of severe infection the growth of the lamina is abnormal (Fig. 2). Frequently, the dark-green areas on the upper surface of the lamina are raised with a corresponding depression on the under-surface (Fig. 1).

A microscopical comparison of sections of healthy and diseased leaves revealed some important differences in the mesophyll tissues (Fig. 3). In the chlorotic area of an infected leaf the tissue is thinner with fewer intercellular spaces, and in severe infection the mesophyll is not differentiated into palisade and spongy parenchyma; the cells are more or less isodiametric in transverse section. The chloroplasts in these cells are rather indistinct. No marked abnormality was observed in the vascular tissue of diseased leaves; occasionally, only a few cells in the phloem tissue were found to be hypertrophied.

Inoculation of plants by rubbing expressed sap from diseased plants transmitted the virus; typical symptoms appeared on inoculated plants within six to eight days after inoculation.

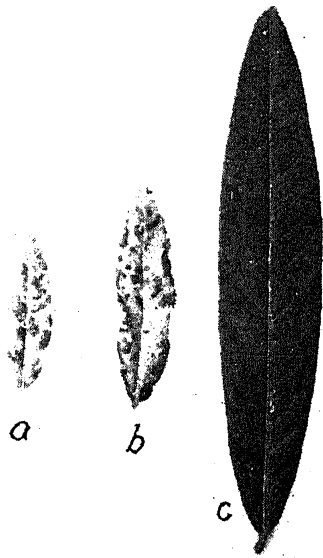


Fig. 1, *a* and *b*, infected leaves of sann-hemp showing typical symptoms of mosaic disease: *c*, healthy leaf of sann-hemp.

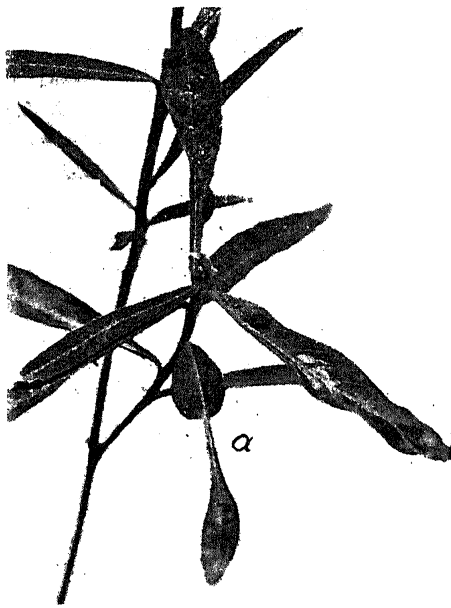


Fig. 2, *a*, abnormal growth of the lamina in a severely infected leaf.

Similar results were obtained when carborundum was used as an abrasive. Disease symptoms were produced within three to four days when the young leaves were punctured with insect needles previously dipped in the inoculum. Control plants were similarly treated with distilled water instead of expressed sap from diseased plants; they were included in every test; they remained healthy. Under glass-house conditions the leaves of inoculated plants are affected from a very early stage of their development.

The virus has a thermal death point of 68-70° C., a longevity *in vitro* of 71-76 days, and can tolerate a dilution of between 1:1000-1:5000.

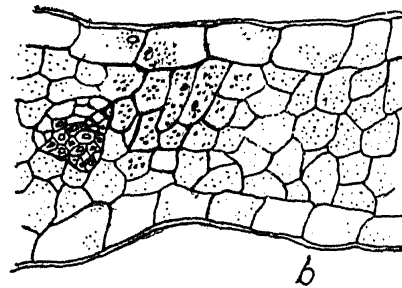
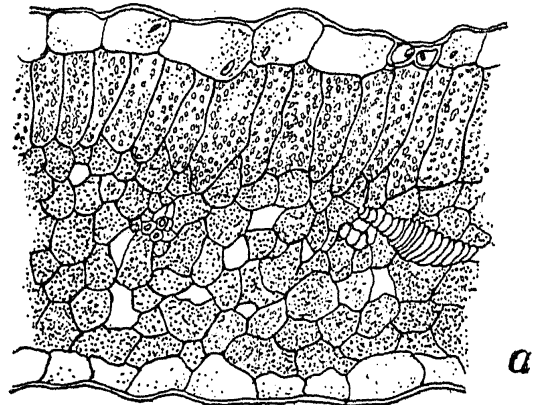


Fig. 3, *a*, t.s. of a healthy leaf × 70; *b*, t.s. of a diseased leaf × 70.

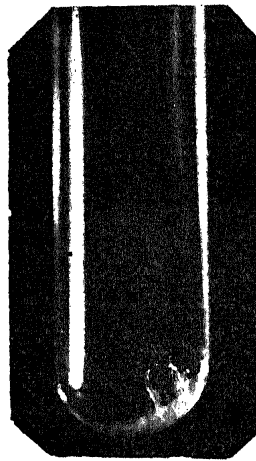


Fig. 4, a white jelly like material accumulated at the bottom of the centrifuge tube.

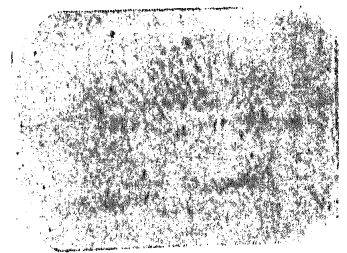


Fig. 5, acicular crystals of sann-hemp mosaic virus × 10

The sann-hemp mosaic virus could not be transmitted to cowpea [*Vigna unguiculata* (Linn.) Walp.], neither could cowpea mosaic virus, which is of very frequent occurrence at Delhi, be transmitted to sann-hemp. Dale¹ reported a mosaic virus of *V. unguiculata* from Trinidad, and concluded from his experiments that the virus of *V. unguiculata* and sann-hemp are one and the same, since the disease could be transmitted from the former to the latter and *vice versa*. The Trinidad virus is, therefore, different from the one collected at Delhi.