The reduction in seed germination and root length over control was as high as 79% and 87% respectively. At lower dilutions only, the toxic principle was inhibitory to tomato, but at higher dilutions it stimulated the seed germination and root elongation. Epinasty with inward rolling of the leaf lamina with necrotic areas were the symptoms observed on detached leaves treated with the culture filtrate. Only wilting was noticed at higher dilutions. The solvent extractable metabolites produced by A. alternata were inhibitory to the test bacteria. The inhibition zones recorded in plates seeded with B. megaterium and B. subtilis were 0.88 and 1.47 cm² respectively.

TLC analysis of the solvent extracts revealed the existence of three phytoxic compounds: (i) A brown coloured elongated spot with an Rf value extending from 0.25 to 0.36, (ii) and (iii) Compounds with blue fluorescence having Rf values of 0.39 and 0.56. Tests with ethanolic ferric chloride, p-anisaldehyde and UV spectral characteristics (peaks at 239 and 279 nm in water and 217 and 277 nm in ethanol) confirm the identity of the brown coloured compound as tenuazonic acid. TLC characteristics of the other two compounds did not coincide with those of alternariol and alternariol monomethyl ether. Besides phytoxicity, the mycotoxic nature of tenuazonic acid is also well established in recent years. Among Alternaria toxins, only tenuazonic acid is listed in the Registry of toxic effects of chemical substances. The natural occurrence of tenuazonic acid in blast diseased rice plants and tomato paste was also reported.

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INHIBITION OF SPINACH MOSAIC VIRUS BY EXTRACTS OF SOME MEDICINAL PLANTS

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It was found earlier that the extracts of different parts from a number of higher plants have antiviral properties. However, nothing is known about the antiviral properties of Aconitum heterophyllum Wall., Anagallis arvensis L., Azadirachta indica A. Juss., Catharanthus roseus (Linn.) G. Don, Digitalis purpurea L., Glycyrrhiza glabra L., Hyoscyamus niger L., Ocimum sanctum L., Rauwolfia serpentina Benth. ex Kurz. and Withania somnifera Dun. Hence, an attempt was made to determine the inhibitory effects of extracts of these plants on spinach mosaic virus (SMV).

The culture of SMV was maintained on Nicotiana glutinosa L. by periodic inoculation inside the insect-proof glass-house. The crude suspension of the virus was prepared by macerating 5 g leaves of N. glutinosa, infected with SMV 8–10 days earlier, with 5 ml distilled water and squeezing through two layers of muslin cloth. The sap thus obtained was centrifuged at 10,000 rpm for 10 min. The pellet was discarded and the supernatant was taken as the standard virus solution. A standard solution of extracts of different parts of the plants was prepared by macerating 5 g of plant material with 5 ml of distilled water and squeezing later through two layers of muslin cloth. The extract thus obtained was centrifuged at 10,000 rpm for 10 min. The standard extracts of SMV and plant-parts were mixed in the ratio of 1:0.5 and 1:1. After 30 min the plants of Chenopodium amaranticolor Coste & Reyn., an indicator host for SMV, were inoculated separately with the mixtures of virus and plant extracts. In each case, five plants having six leaves of approximately the same leaf area were inoculated. Plants inoculated with distilled water in the ratio of 1:0.5 and 1:1 served as control. The number of local lesions evoked after 5–7 days of inoculation was counted. The percentage of inhibition was calculated as: \( \frac{(A-B)}{A} \times 100 \) (where A is the number of lesions in plants inoculated with virus solution diluted in distilled water and B the number of lesions in plants inoculated with virus solution treated with plant extract).

The results presented in table 1 indicate that extracts of all medicinal plants inhibited the spinach mosaic virus to a varying degree. The inhibition effect of plant extracts was directly correlated with increase in the concentration. Highest inhibition of SMV was achieved in the extracts of leaves of O. sanctum L., followed by the roots of G. glabra L., leaves of A. arvensis L., roots of A. heterophyllum Wall., leaves of A. indica A. Juss., leaves of C. roseus (Linn.) G. Don and roots of R. serpentina Benth. ex Kurz.

Fukushima demonstrated that digitalin, a glycoside, destroyed the virulence of tobacco mosaic virus (TMV), while Kalichev et al. reported that quinine reduced the multiplication of TMV. Others reported that tannin present in the plant extract was responsible for virus inhibition. It is likely that extracts of plant-parts tested might contain certain compounds which bring about inhibitory effects. This aspect needs further investigation.

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