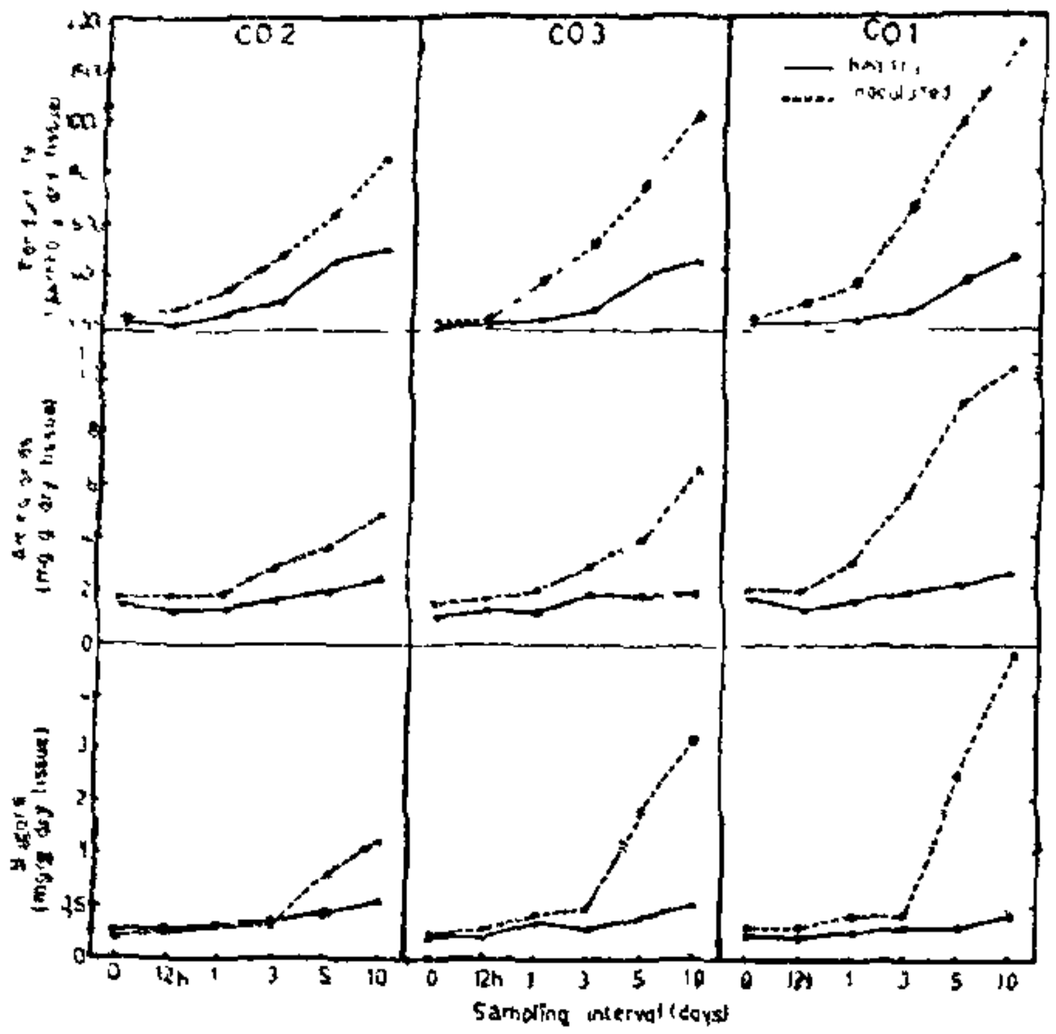

FIG. 1. Changes in permeability alterations due to X-phaseoli inoculation.

tedly plays a role in the supply of nutrients to the invading pathogen ; besides, these changes can bring about an alteration in cell compartmentation or in the cell bound enzymes[9]. Such changes could be responsible for the different metabolic events in host-parasite relationship[10]. The present study clearly shows that the host membrane as barrier has been altered and it is in agreement with the findings of Hoppe and Heitefuss[5]. It is clear that the loss of materials is high in the most susceptible CO 1 and the least in CO 2.

It is of relevence to quote the findings of Keen and Kennedy[11] who found that the electrolyte loss was much pronounced in a compatible soybean *Pseudomonas glycinea* race combination rather than in an incompatible combination. Further, concomitant to the appearance of lesion there has been an increase in the loss of electrolytes, sugars and amino acids (5th day of inoculation). Williams and Keen[12] and Cook and Stall[13] also found that these increases corresponded to the appearance of disease symptoms in susceptible reactions and were likely of significance in the multiplication of pathogen and their movement through intercellular space of the leaves.

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APHIS CITRICOLA VAN DER GOOT— A NEW VECTOR OF CITRUS TRISTEZA VIRUS IN INDIA

IN India, *Aphis citricola* van der Goot (*spiraecola* Patch) has been recorded as a pest of citrus and also found feeding on *Tridax procumbens*, a weed commonly found in citrus orchards in Kodagu, Karnataka State[5]. During the survey of citrus orchards in Karnataka and Kerala, the author also observed the occurrence of this aphid as a pest on various citrus species, Barbodos Cherry (*Malphighia glabra* L.) and also on Gandhigulabi (*Euphatorium odoratom* L.) in the months of April to August. The colour of the aphid varies from yellowish-green to green and found feeding on tender flushes. Infestation of this aphid could be identified from a distance by the appearance of downward curling and crinkling of attacked leaves. No information about the transmission of citrus tristeza virus (CTV) by *A. citricola* in India is available, hence transmission studies were conducted at Citrus Experiment Station, Gonicoppal, during 1979 and the results are reported in this paper.

The aphids were reared on *Citrus sinensis* Osbeck CV. Sathgudi seedlings in the screened cages from naturally infested mandarin plants (*C. reticulata* Blanco) through single apterous aphid. The source of the virus was a severe isolate of citrus tristeza virus (CTV) which induced cupping, vein-clearings and stempittings on acid lime [*C. aurantifolia* (Christm.) Swing.] originated from naturally infected field grown Coorg mandarin plant. Seedlings of Sathgudi were

graft inoculated with this isolate and used for acquisition feeding. Infectivity was tested on 2-month old 6–8 cm tall acid lime seedlings grown individually in polythene bags of 20 × 15 cm size. Mature apterous aphids were allowed to feed on infected source plants in dark. After 24-hour acquisition period, aphids in groups of 25 numbers were transferred on to the test plants with a camel's hair brush. Aphids were killed by spraying with an insecticide (Metacid 0·05%) after 24 hour infection period. The test seedlings were kept in separate glasshouse for observations.

Out of 75 acid lime seedlings inoculated, 6 plants (eight per cent) showed cupping, vein-clearings and stem pitting symptoms of CTV as reported by Wallace and Drake[8], and Capoor[1] with in 60 days after inoculation. The association of this virus with the infected plants was further confirmed by reinoculation to healthy acid lime seedlings through *Toxoptera citricidus* (Kirk.). The low transmission rate of severe isolate of CTV obtained with this aphid species in the present study is similar to that reported with *A. spiraecola* Patch in Florida by Norman and Grant[3]. On the contrary in Israel *A. citricola* (*spiraecola* Patch) failed to transmit the VT isolate of CTV[4]. In India the presence of the vector *A. citricola* (*spiraecola* Patch) will increase the potential of natural spread of tristeza virus, in addition to *T. citricidus*[8], *A. gossypii* Glov. and *Myzus persicae* (Sulz.)[6]; *A. craccivora* (Koch.) and *Dactynotus jaceae* (L.)[1] and *T. aurantii* (B.D.F.)[2]. In Israel melon aphid *A. gossypii* has transmitted one strain of tristeza virus, upto 40%, and other two strains, less than five per cent[4]. Capoor and Rao[2] observed that *T. aurantii* could transmit only mild strain of tristeza virus. Transmission studies with *A. citricola* from different hosts, as well as on different strains of CTV from various donor plants are under progress.

Thus, *Aphis citricola* (*spiraecola* Patch) is found to be the vector of CTV from India.

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CHOLESTEROL CONTENT IN THE MYCELIUM OF FIFTEEN SPECIES OF *HELMINTHOSPORIUM*

STEROLIC compounds are known to occur in dilute concentrations in a large number of fungi. Ergosterol, a fungal sterol, is quite widespread and is known from diverse groups of fungi. Cholesterol, another closely related compound, is known to increase the temperature tolerance and oospore formation in *Pythium atrotrogus*[1]. In the present study cholesterol distribution in fifteen species of *Helminthosporium* was investigated with the hope that it may throw some light on the taxonomy of this genus.

Monosporic cultures of fifteen species were grown on Asthana and Hawker's medium 'A' at 27 ± 2° C. At the end of 10 days incubation, 50 mg of dry mycelium harvested on Whatman filter paper No. 42 was analysed for cholesterol content by the method suggested by Plumer[2]. Fungal mats were homogenized in alcohol : acetone (1 : 1) mixture and heated on a hot water bath for a few minutes and subsequently cooled and centrifuged at 1,800 × g for 30 minutes. The supernatant was evaporated to dryness. The resultant residue was redissolved in two ml chloroform. To this solution, 2 ml acetic anhydride and sulphuric acid (30 : 1) mixture was added and kept in darkness for twenty minutes. The colour thus developed was read at 680 nm in spekol. The quantity of cholesterol was read from standard curve of cholesterol and the results are precised in Table I.

From Table I it is clear that all the species under study showed cholesterol in their mycelial mats. However, the amount varied with the species. It was nearly 2% of the dried mycelium in *H. Halnii* and *H. hawaiiensis*. The least amount of cholesterol was shown by *H. spicifeum*. The highest level of choles-