Advisory leaflet **10**
1979

SOUTH PACIFIC COMMISSION

DASHEEN MOSAIC VIRUS

Taro leaf with feathering symptoms caused by dasheen mosaic virus.

DASHEEN MOSAIC is caused by a virus that infects taro (*Colocasia*) and certain other members of the family Araceae, including *Alocasia*, *Amorphophallus* and *Xanthosoma*. The virus is not known to infect plants outside this family.

Dasheen Mosaic Virus (DMV) was originally described in 1970 from Florida, U.S.A., but now it is recognised as a pathogen of taro in other areas of the world including Egypt, India, Japan, the Caribbean and South America. The virus is probably present throughout the South Pacific region and is also present in Hawaii. When examined with an electron microscope the virus appears as flexuous, slender, rod-shaped particles **(Fig. 1).**

SYMPTOMS

DMV does not cause a lethal disease; its chief effect is to retard plant growth thereby reducing tuber yield. Infected corms show no diagnostic symptoms but conspicuous mosaic, streak and/or mottle symptoms are evident on the foliage of diseased plants. Symptoms are often expressed as a "feathering" pattern of mosaic which appears to follow the leaf veins **(see front cover).**

FIG. 1: *Filamentous particles of DMV. Each strand is about 7500 Angstroms long. (An Angstrom unit is a hundred-millionth of a centimetre.)*

Taro cultivars may differ considerably in the intensity with which symptoms are expressed **(Figs. 2 and 3).** In some, the leaves with symptoms are readily apparent whereas in other, more tolerant, cultivars foliar symptoms occur only occasionally. Plants have a normal appearance during the periods between symptom development.

INFECTION AND SPREAD

Insect transmission

DMV is spread by the winged forms of several species of aphids. Of the aphids infesting taro in the South Pacific region, the cotton-melon aphid, *Aphis gossypii*, occurs most frequently and is likely to be important in spreading the virus. Virus acquisition and subsequent transmission is extremely rapid and can occur in a matter of seconds. The relative ability of different aphid species to transmit this virus has no apparent relation to the host plant preference of the aphid; therefore, many species can be expected to act as vectors under field conditions. DMV can also be transmitted when sap from infected plants comes into contact with wounded surfaces of healthy plants but this means of spread seems to be less important than aphid transmission.

Spread with planting material

Vegetative planting material taken from diseased plants will be infected even though foliar symptoms may not be showing on the parent plants. The use of such planting material is undoubtedly the most important means by which DMV is introduced to new areas. Indiscriminate import and subsequent release of taro germ plasm from overseas is especially likely to result in the distribution of this and

other serious pathogens of taro. Once introduced, DMV can be spread rapidly to nearby healthy plants by winged aphids.

EFFECT OF THE DISEASE

There is no information on the effects of DMV on taro yields but it is very likely that corm size and quality are reduced considerably. The presence of this virus should not be lightly regarded despite its failure to kill infected plants or to induce noticeable corm symptoms. The virus can cause considerable losses in production of the ornamentals *Caladium, Dieffenbachia* and *Philodendron* which are plants related to taro.

CONTROL

Once established, DMV is difficult to control because the acquisition and transmission of the virus by aphids is so rapid and the virus exists indefinitely in diseased plants and their suckers. This should be borne in mind when considering the control measures discussed in the following sections.

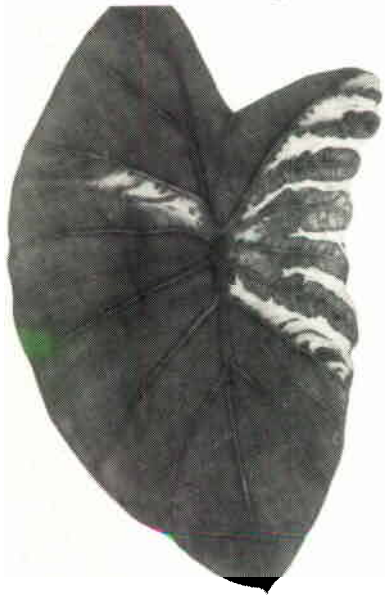

FIG. 3: *Localised mosaic symptoms induced by DMV.*

FIG. 2: *DMV induced mosaic and distortion symptoms affecting the whole leaf.*

Exclusion of virus-infected plants

In countries where DMV has not been recorded strict quarantine measures should be observed to prevent its introduction. Even in countries where the disease occurs some degree of restriction on the movement of planting material may be worthwhile. It has been observed that the incidence of DMV is particularly high in taro and other aroids grown intensively. In contrast, virus incidence seems to be much lower in plantings grown in relative isolation. Accordingly, the most practical means of controlling dasheen mosaic is to prevent the movement of diseased plants to uninfected areas.

Destruction of diseased plants

Removing (roguing) and destroying diseased plants offers a possible method of controlling DMV once infection has become established in a

planting. Roguing should be done as soon as symptoms appear, and after plants have been removed they should be burnt. Plants should be sprayed with insecticide before removal. Otherwise if winged adult aphids are present they may migrate to other, healthy, plants and spread the disease.

Chemical control

It is not possible to spray healthy plants with chemicals to protect them from aphids transmitting the virus. But insecticides can be used to spray individual infected plants before roguing. Either Malathion 50% e.c. (2 ml/l water) or the systemic insecticide Acephate 75% w.p. (0.75 g/l water) can be used. The addition of a wetter may be necessary to increase the effectiveness of the sprays.

Resistant cultivars

No taro cultivars resistant to DMV are known but there is some indication that cultivars differ in their reaction to infection. No detailed studies have been made on this aspect of control.

DMV is not seed-borne but taro seed is not readily available and in any case plants grown from seed differ from the horticulturally preferred parent stock because taro does not breed true. However, selection for resistance within seedling populations may be a solution to the disease in the long term.

LEAFLETS IN THIS SERIES

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Banana bunchy top virus (Advisory Leaflet 2, 1977).

Taro leaf blight (Advisory Leaflet 3, 1977).

Coconut palm rhinoceros beetle (Advisory Leaflet 4, 1977).

Banana burrowing nematode (Advisory Leaflet 5, 1977).

Giant African snail (Advisory Leaflet 6, 1977).

Black pod and canker of cocoa (Advisory Leaflet 7, 1978).

Alomae and bobone diseases of taro (Advisory Leaflet 8, 1978).

Root-knot nematodes (Advisory Leaflet 9, 1979).

Dasheen mosaic virus (Advisory Leaflet 10, 1979).

Rat damage to agricultural crops (Advisory Leaflet 11, 1979).

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