CARNATION PIMPLE -- A NEW BACTERIAL DISEASE

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Specimens of carnations sent to Colorado A & M College from Prescott, Arizona, in the spring of 1952 had small, clear, pimple-like spots on the leaves and stems. The spots were more prominent along the veins on the undersides of the leaves, and they were quite prevalent near the tips of the leaves. Occasional spots were present on the stems between leaves. The disease reportedly had caused sevère damage of plants which was evidenced by the drying or withering of the leaves.

Isolations from these specimens yielded a slow-growing, yellow, Gram-negative, motile bacterium. Laboratory studies showed that it could not reduce nitrates or proteins. The optimum temperature for growth was between 25° and 27°C. There was no indication

in the literature that this bacterium had ever been reported or described. Its characteristics most closely resembled those of a bacterium previously isolated from a leaf blight of rice. It has been named Xanthomonas oryzae var. dianthi. /1

The pathogenicity of the organism was demonstrated on carnation varieties White Patrician and Miller's Yellow. The disease was reproduced by inoculating plants, which had been grown in pots for five months, with a bacterial suspension. Inoculations were made in several ways: (1) injuring the roots and applying 50 ml. of bacterial suspension in sterile distilled water to the soil surface; (2) applying 50 ml. bacterial suspension to the soil without injuring the roots; and (3) spraying the stems and leaves with the bacterial suspension. Each treatment was replicated six times. Characteristic pimple-like blisters appeared on the stems and leaves of those plants which had been treated by soil inoculation within a period of four days, regardless of root injury. The plants treated by spray developed symptoms in from four to eight days. Noninoculated check plants showed no symptoms. The organism was recovered with difficulty from each artificially infected plant, by employing a special technique.

A similar test was conducted with Dianthus barbatus as the host plant. In each case, plants inoculated with the organism developed characteristic symptoms within a period of eight days.

The results indicated that the organism could invade tissues of species of Dianthus directly and that wounds were unnecessary. It apparently was well adapted to being taken up by the roots, and transported to the upper portions of the plant. Examination of the conducting tissues of infected plants showed the bacteria were present and caused a swelling of cells of such tissue beneath the pimples.

This disease has been observed in the Denver area but no damage has been reported yet. Evidence in experimental benches showed that the bacteria may spread rapidly, but the manner of spread as yet, is unknown. It is suspected that irrigation and splashing of irrigation water may aid the spread of the bacteria. The disease is moreover of a type that can be spread easily by means of cuttings. In view of this, it is advisable to examine cuttings for the presence of the disease prior to rooting. No other control is yet known.