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# COLOR BREAK IN ORCHID FLOWERS

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*Abstract.* **Color break in orchids, once thought to occur solely in *Cattleyas,* has been reported in *Odontoglossum*, *Cymbidium*, *Vanilla*, *Epidendrum*, *Encyclia*, *Oncidium*, *Phalaenopsis*, and many other orchid genera. At one time, color break was thought to be caused by two distinct strains, mild and severe, causing both petals and sepals to be marked with irregular areas which develop at random and which are lighter or darker than the normal flower color. There was no malformation or distortion of flowers in the mild strain. However, the two strains are now classified as Odontoglossum ringspot tobamovirus (ORSV). ELISA was used to verify the presence of the virus. Both petals and sepals from the *Cattleya* and *Phalaenopsis* were marked with irregular areas that developed at random and were lighter or darker than normal flowers. In some *Cattleya* flowers the virus caused necrotic flecking.**

Odontoglossum ringspot tobamovirus (ORSV) is the most prevalent and economically important virus infecting orchids in Florida as well as worldwide (Jensen and Gold, 1951; Lawson et al., 1986; Zettler et al., 1990). Color break in orchids, once thought to occur solely in *Cattleya*, has been reported in *Odontoglossum*, *Cymbidium*, *Vanilla*, *Epidendrum*, *Encyclia*, *Oncidium*, *Phalaenopsis*, and many other orchid genera (Burnett, 1965). At one time, color break was thought to be caused by two distinct virus strains, mild and severe (Burnett, 1965). Severe color break is characterized by variegation in the flower, where the normal pigment of the petals and sepals is replaced with irregular patches of tissue that is either more or less intense in color than the normal flower (Burnett, 1965). There was no malformation or distortion of flowers in the mild strain. The leaf symptoms range from absent to mild mosaic symptoms. However, these two strains are now classified as ORSV (Alfieri et al., 1991). Odontoglossum ringspot also causes brown necrotic streak in Cattleya blossoms (Thornberry and Phillippe, 1964). The purpose of this study was to determine if orchids expressing symptoms typical of ORSV were in fact infected with ORSV.

## Materials and Methods

Enzyme-linked immunosorbent assay (ELISA) testing was used to establish the presence of ORSV in the 50 orchid plants tested in this study. The plants included *Cattleya*, *Encyclia*, and *Phalaenopsis* expressing the typical ORSV symptoms and were collected from private orchid collections and commercial orchid nurseries.

Fig. 1. *Cattleya* flower displaying color break caused by ORSV.

## Results and Discussion

ELISA results indicated that all 50 of the flowers that were expressing the typical symptoms of ORSV were positive for ORSV. During odontoglossum ringspot, causing color break, both petals and sepals were marked with irregular areas which develop at random and which are lighter or darker than the normal flower color as shown in *Cattleya* (Fig. 1) and *Phalaenopsis* (Fig. 2). There was malformation and distortion of flowers caused by ORSV in *Cattleya* (Fig. 3) and *Encyclia* (Fig. 4). Severe color break was characterized by variegation in the flower, where the normal pigment of the petals and

Fig. 2. *Phalaenopsis* flower displaying color break caused by ORSV.

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Fig. 3. Malformation and distortion of flowers caused by ORSV in *Cattleya*.

Fig. 5. Normal pigment of the petals and sepals is replaced with irregular patches in *Cattleya* infected with ORSV.

sepals is replaced with irregular patches of tissue that is either more or less intense in color than the normal flower in *Cattleya* (Fig. 5). One *Cattleya* was found to be showing brown necrotic streak caused by ORSV (Fig. 6).

Fig. 4. Malformation and distortion of flowers caused by ORSV in *Encyclia*.

Fig. 6. Necrotic streak caused by ORSV in *Cattleya*.

## Literature Cited


Alfieri, S. A., Jr., K. R. Langdon, J. W. Kimbrough, N. E. El-Gholl, and C. Wehlburg. 1991. Diseases and disorders of plants in Florida. Bul. No. 14. FDACS, DPI.

Burnett, H. C. 1965. Orchid Diseases. Vol. 1, No. 3. State of Fla. Dept. of Agr.

Jensen, D. D. and A. H. Gold. 1951. A virus ring spot of Odontoglossum orchid: symptoms, transmission, and electron microscopy. Phytopathology 41:648-653.

Lawson, R. H. and M. Brannigan. 1986. Handbook on orchid pests and diseases. Amer. Orchid Soc., West Palm Beach, Fla. pp. 2-49.

Thornberry, H. H. and M. R. Phillippe. 1964. Orchid disease: Cattleya blossom brown necrotic streak. Plant Dis. Rptr. 48:936-940.

Zettler, F. W., N.-J. Ko, G. C. Wisler, M. S. Elliott, and S.-M. Wong. 1990. Viruses of orchids and their control. Plant Dis. 74:621-626.