

Physiological Disorders of Orchids: Oedema

R.A. Cating, A.J. Palmateer, C.M. Stiles, P.F. Harmon and D.A. Davison

Oedema is a physiological disorder of orchids caused by overwatering. The excess water is absorbed by the roots quicker than it is lost by the leaves, which can cause swelling of plant cells and produce a lesion resembling a blister. This condition frequently occurs during periods of cool weather when water quantity and/or frequency is not reduced. The blister-like symptoms can appear on upper or lower leaf surfaces, stems, petals or sepals.

Symptoms

Symptoms of oedema can take on many forms. Generally, small, swollen blister-like structures develop that may become corky with age (Figures 1-8), and are usually round, but may have other shapes (Figure 3). The plant tissue beneath the blister will frequently remain green (Figure 9). Occasionally, blisters may be misidentified as scale insects because of shape and size. However, scale insects can be easily rubbed off, while oedema blisters cannot (Figures 13 and 14).

If a cross-section through symptomatic tissue is made, enlarged cells can be seen below the epidermis (outer-most layer of cells on a leaf), which gives the lesion a raised or swollen appearance (Figure 10).

Diagnosis

Orchid diseases and disorders can be caused by living pathogens (bacteria and fungi), or environmental conditions (heat, cold, light, etc.). Making the distinction between biotic (living organism) and abiotic (non-living) causes of the disorder is crucial for effective orchid health management. For example, spraying a chemical fungicide would be a waste of time and money if the cause of leaf damage is sunburn, oedema, etc.

As a general guide, you may have oedema if the following occur: Blisters are slightly raised without a yellow halo or water soaked margins, which may indicate the presence of a pathogen. Figure 11 shows an example of a lesion with a yellow halo, while water soaking can be seen in Figure 12.

Blisters are round and/or have a corky layer over the top (Figure 9).

Green tissue can be seen underneath of top layer (Figure 9).

Oedema blisters cannot be rubbed off. Scale insects can easily be removed (Figures 13 and 14).

Management

Many consumers are unwilling to purchase plants with visible symptoms of an underlying disorder. Therefore, the prevention of oedema can be economically advantageous in certain orchid genera that are prone to oedema, such as *Phalaenopsis* species

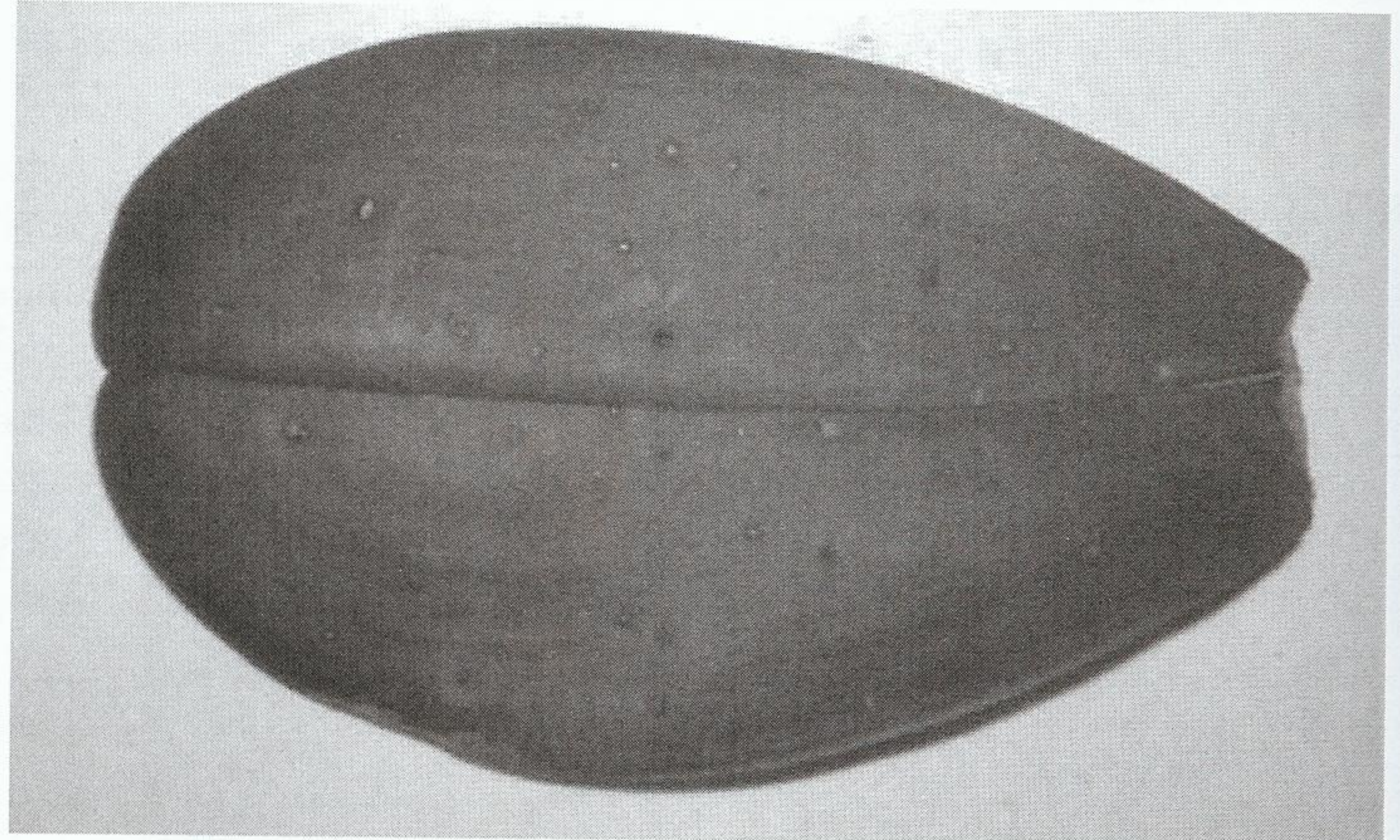


Figure 1. *Phalaenopsis* hybrid leaf with symptoms of oedema. Notice the numerous round spots scattered over the leaf. A close-up view can be seen in Figure 2.

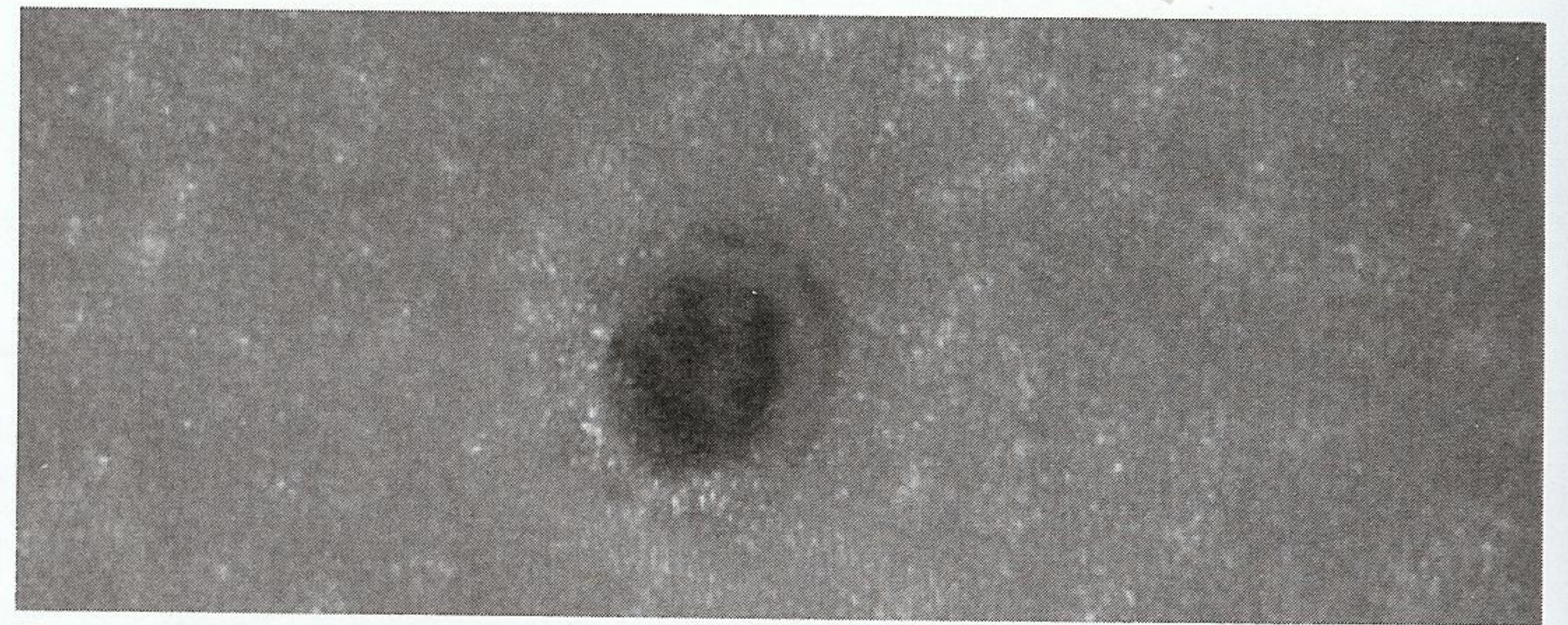


Figure 2. Close-up view of oedema blister on a *Phalaenopsis* hybrid leaf.



Figure 3. Oedema on lower surface of a *Phalaenopsis* hybrid leaf.

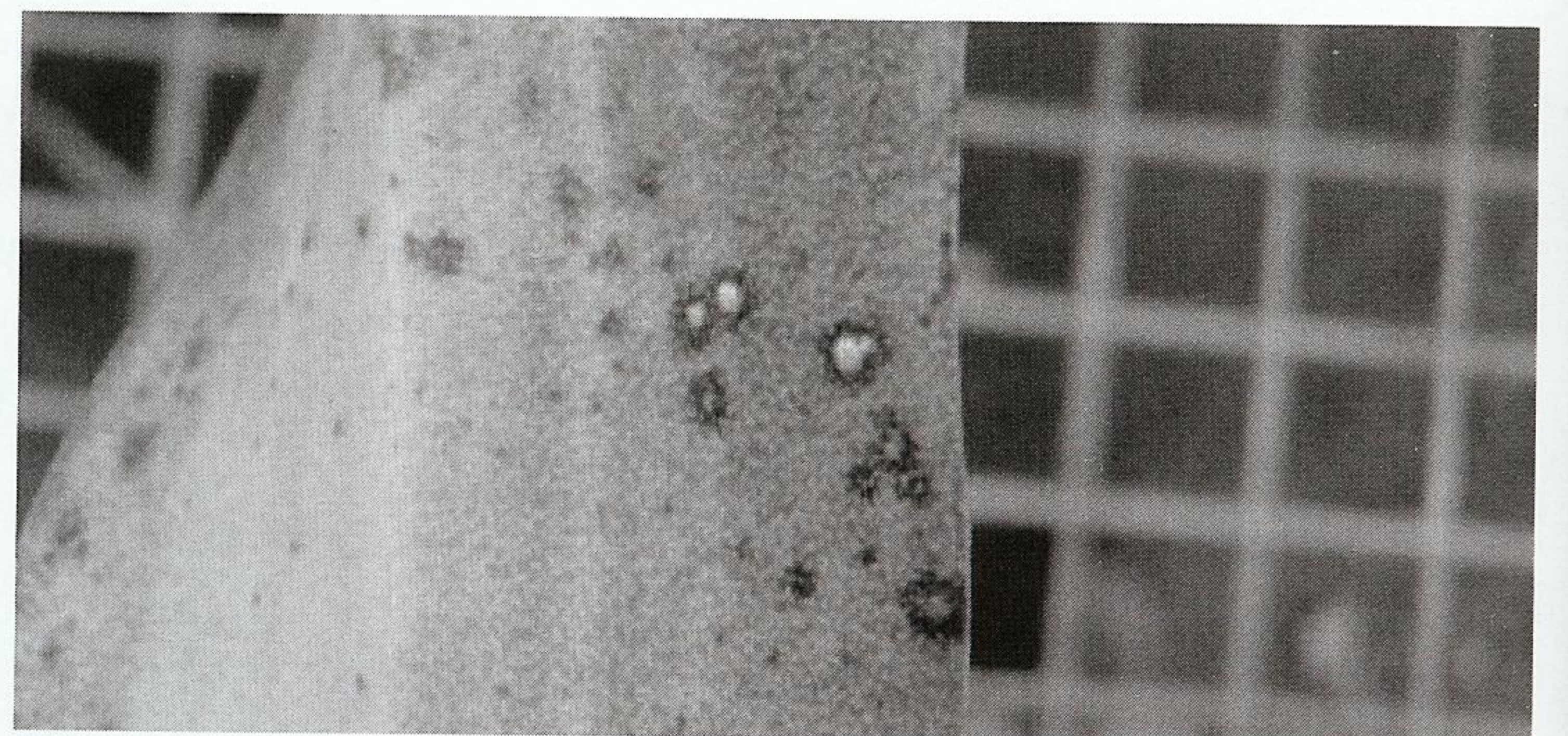


Figure 4. Oedema on the lower surface of a *Rhynchosstylis* hybrid leaf.

Photos by: R.A. Cating

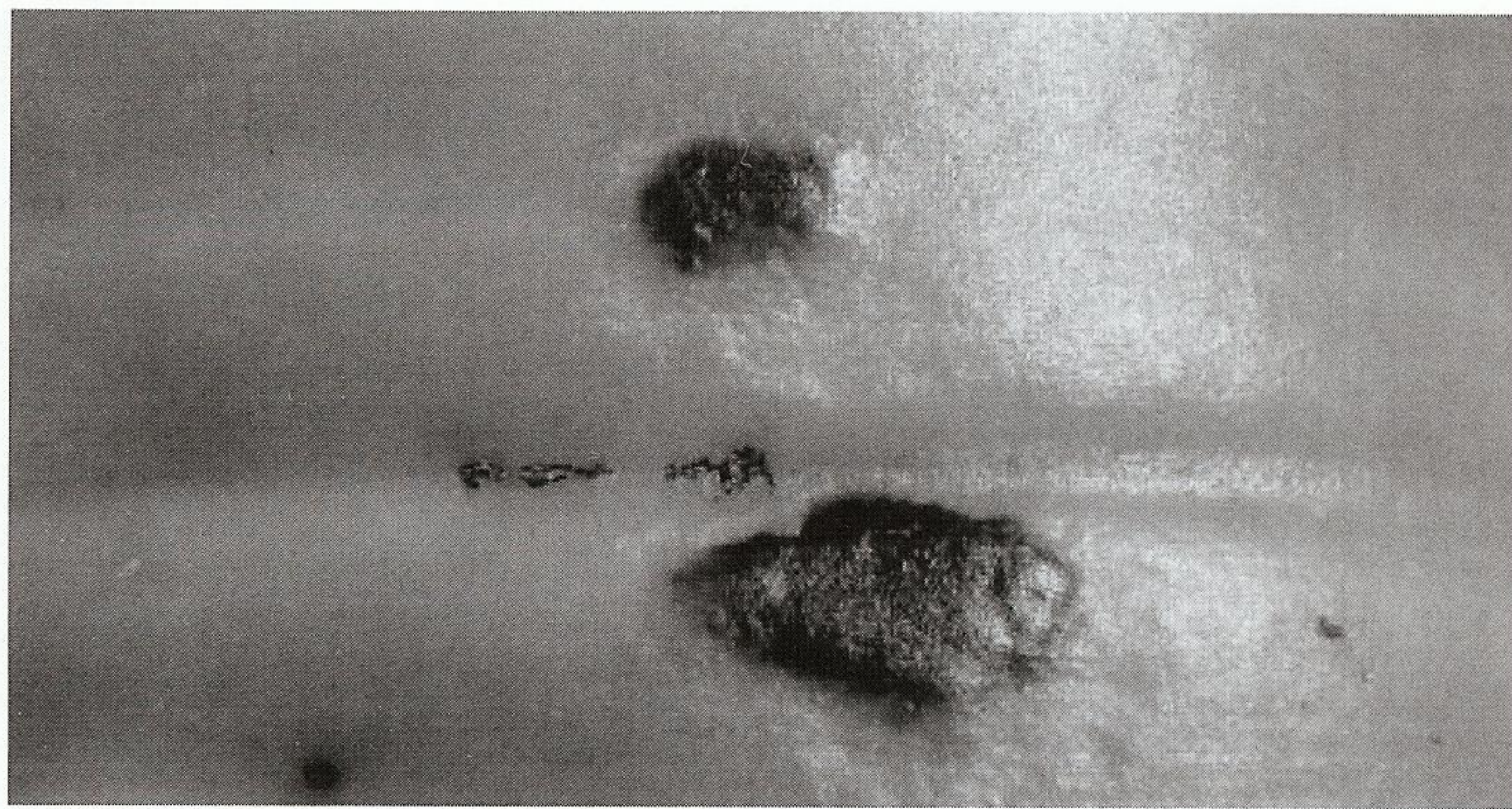


Figure 5. Oedema on the upper surface of a *Cattleya* hybrid leaf.

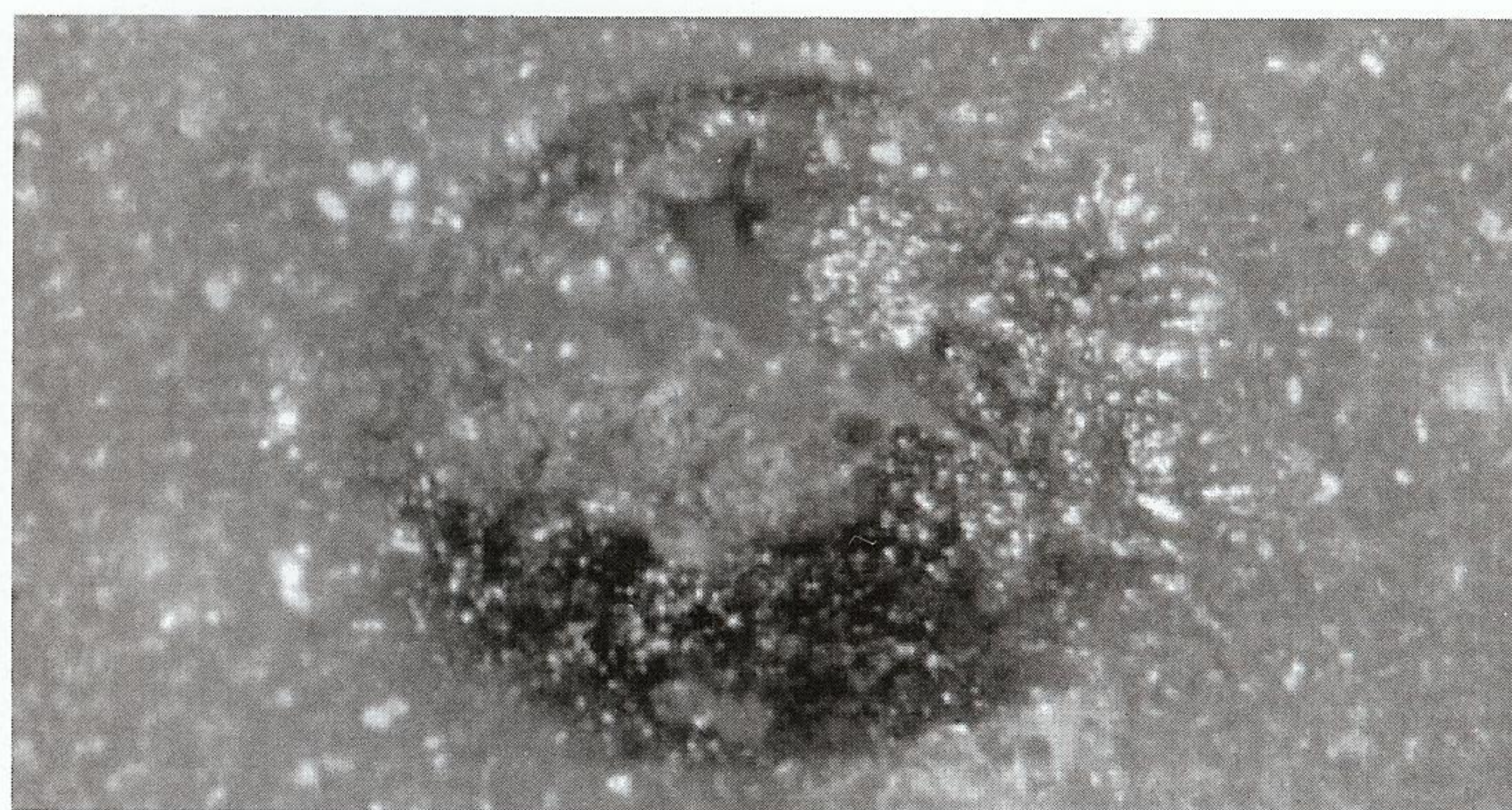


Figure 9. Oedema blister on *Phalaenopsis* hybrid showing green tissue underneath.



Figure 6. Oedema on lower surface of a *Cattleya* hybrid leaf.

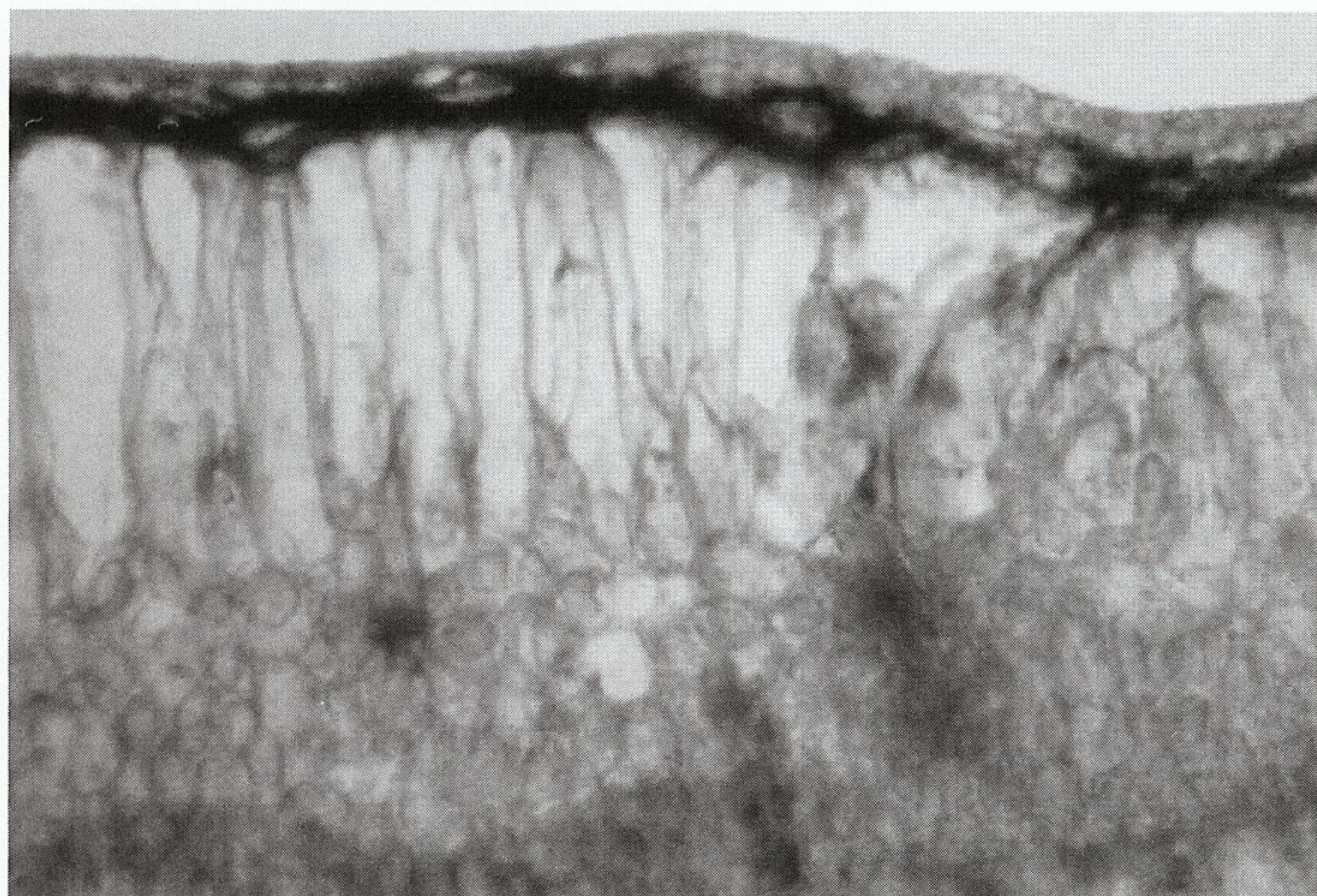


Figure 10. Cross-section of a trough oedema blister on the same *Bulbophyllum* hybrid as in figure 8. Notice how the cells below the upper epidermis have become enlarged, causing a swollen or blister-like appearance.



Figure 7. Oedema blisters on the flower of *Encyclia cordigera*.



Figure 11. Bacterial leaf spots on a *Vanda* hybrid caused by *Acidovorax* sp. On the left, the dark spots can be seen with yellow margins or halos, while on the spot on the right, the yellow has become more widespread.

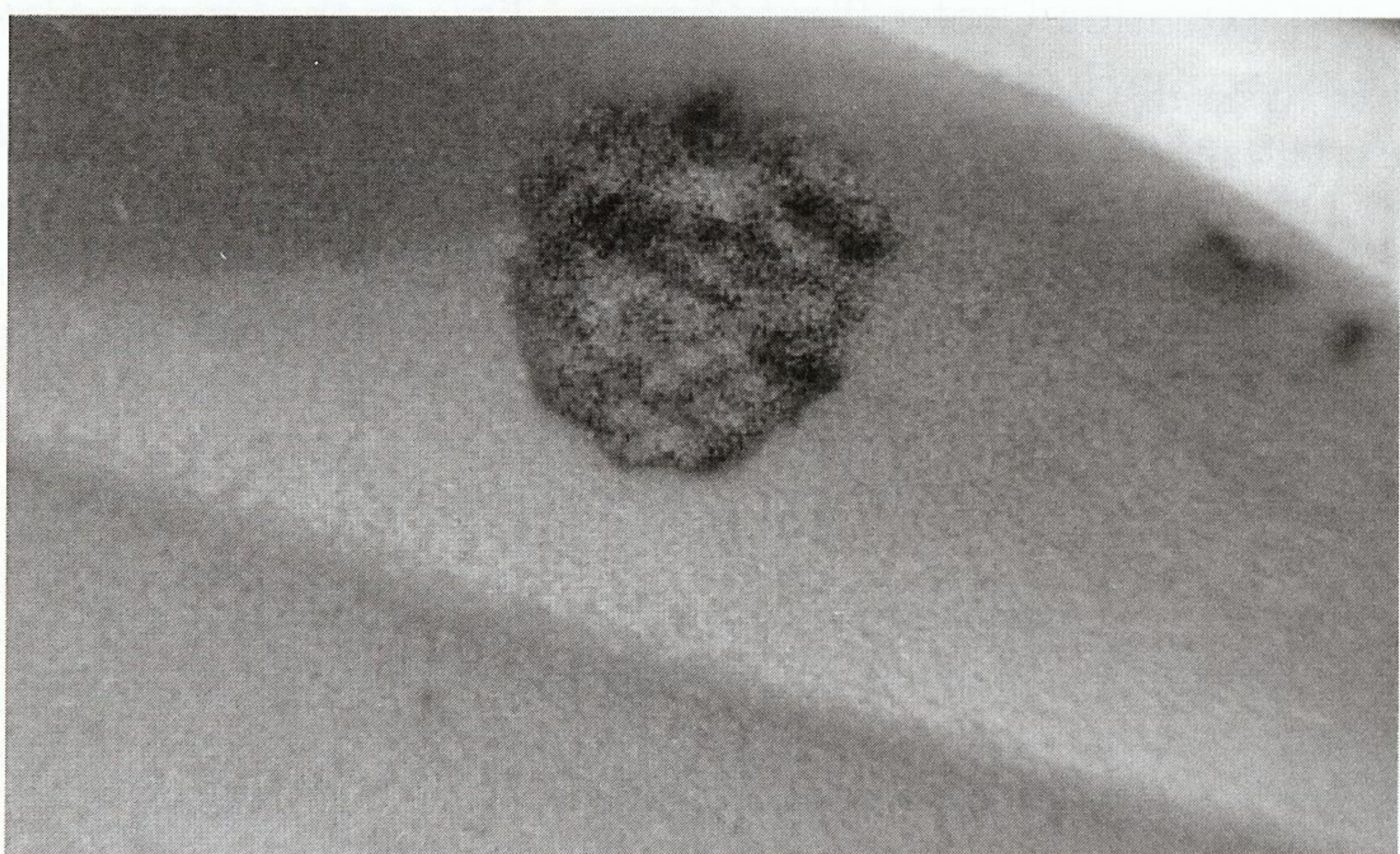


Figure 8. Oedema on the lower surface of a *Bulbophyllum* hybrid leaf.



Figure 12. Bacterial spot on an *Oncidium* hybrid caused by *Burkholderia* sp. Water soaking can be seen as a watery, fluid-filled area surrounding the lesion.

IPA Symposium 2017

It's official!

Our 23rd IPA Symposium is confirmed for July, 2017, in Philadelphia, PA

The venue will be at the Hilton Embassy Suites at the Philadelphia airport on July 14 & 15th.

We're currently inviting speakers & vendors for this great event so stay connected on the IPA Facebook page or the IPA website at www.phal.org

We will have Registration Forms ready for early bird registrations in the next couple of months, complete with announcements of our featured speakers & invited vendors.

So mark your calendars now!

The host hotel has been extremely gracious in extending their special IPA group room rate for two days prior to and following the event, so you might want to make a special Philadelphia vacation of it due to the hotel's very attractive room rates & free parking for all IPA Symposium attendees.

Embassy Suites by Hilton Philadelphia Airport
9000 Bartram Avenue
Philadelphia, Pennsylvania, 19153, USA
TEL: +1-215-365-4500 FAX: +1-215-365-3195

The Embassy Suites Philadelphia - Airport hotel is a fantastic base for leisure guests wishing to explore Philadelphia.

Visit downtown Philadelphia and enjoy the array of shopping, dining and entertainment attractions. There are several museums, as well as the famous Penn's Landing, where the state's founder was rumored to have landed in 1682.

Visit the quaint Independence Hall, marvel at the collection at the Philadelphia Museum of Art, or explore the Academy of Natural Science.

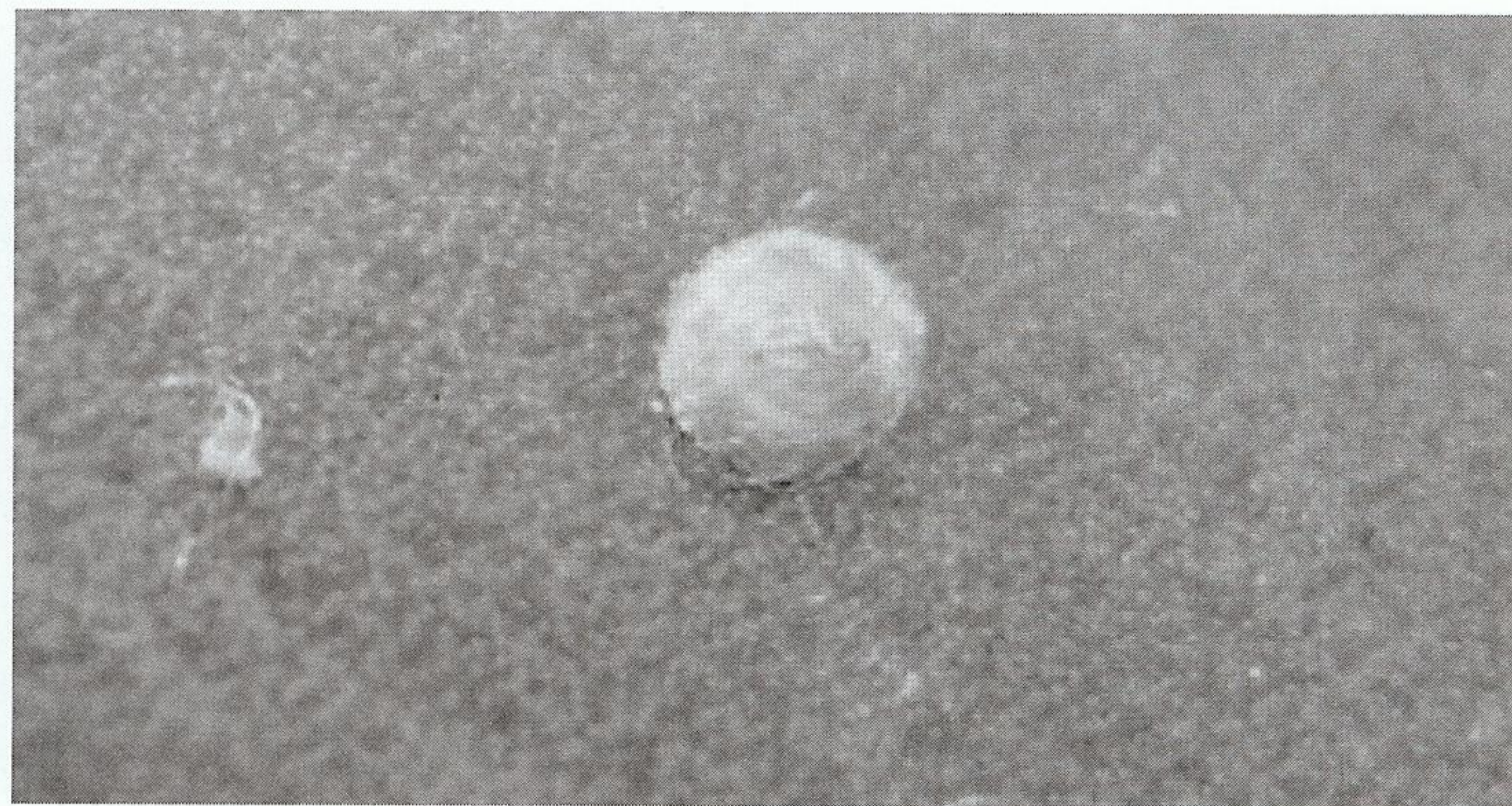


Figure 13. Scale insect on the lower side of a *Cattleya* hybrid leaf.



Figure 14. This shows the same scale insect being lifted with a metal probe. Scale insects can be easily removed, while oedema blisters cannot.

and hybrids. Once an orchid has oedema, the lesions are permanent. However, symptomatic plants can produce new, healthy growth when more favorable growing conditions return. Because oedema is not caused by a pathogen, no disease control measures are required.

In order to minimize oedema, growers should make sure that plants are being watered correctly and not receiving excessive moisture in the form of rain if left outdoors, particularly during cool weather. The condition of the growing media should also be examined to make sure it is not retaining too much water because of media decomposition. Spacing plants farther apart to increase air movement in the canopy may also reduce the occurrence of oedema. Improve the flow of air over the leaves by spacing plants farther apart and increasing ventilation.

Plant material can be sent to one of the UF Tropical Research and Extension Center Plant Disease Clinic or the Oregon State University-Hermiston Plant Pathology Lab for diagnosis.

For information, go to <http://www.plantclinic.org/> or <http://oregonstate.edu/dept/hermiston/plant-pathology-plant-lab-testing> or contact Dr. Robert Cating at Robert.cating@oregonstate.edu. ❁