



Identifying Anthurium Flower Injuries

Brian C. Bushe, Wayne T. Nishijima, Arnold H. Hara, and Dwight M. Sato
Department of Plant and Environmental Protection Sciences

Anthurium (*Anthurium andraeanum* André), a native of tropical America, is a perennial plant that grows best under shaded, humid conditions. During the early development of the industry, shade was provided for anthuriums by tree ferns or other trees. Since then, many commercial nurseries have used polypropylene shade cloth along with supplemental irrigation to provide anthuriums with a favorable growing environment. This conversion decreased floral injuries by eliminating inconsistent shading and reducing falling debris. However, studies conducted under shadehouse conditions have demonstrated that flower rejection by shippers can amount to as much as 50 percent of the total flowers harvested⁽¹⁾. The reasons for rejection commonly were diseases, and injuries caused by insects, environmental stresses, or mechanical means. The incidence of mechanical injury was observed to be substantially greater than other types of injuries. Anthurium flowers exported as Hawaii Extra Fancy, Hawaii Fancy, and Hawaii Choice must be free from diseases and from injuries caused by insects or by mechanical or other means⁽²⁾.

As an initial step in the development of an integrated pest management program for anthurium, common floral injuries associated with rejection were documented as a reference for growers. To help them accurately identify the causes of common floral injuries, this publication provides descriptions and illustrations of symptoms caused by infectious and noninfectious agents.

References

1. Hara, A. H., W. T. Nishijima, D. M. Sato, and B. C. Bushe. October 1985. Progress report on the Hawaii Anthurium Integrated Pest Management Program. College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa. 29 pp.
2. Hawaii Department of Agriculture. May 29, 1981. Standards for anthuriums. Division of Marketing and Consumer Services.

Acknowledgments

The authors wish to thank Dr. Tadashi Higaki and Dr. Ronald F. L. Mau for some of the photographs used in this publication.

*This publication replaces HITAHR Brief no. 073, 1987, with some slight revisions. It is available only in PDF format at <http://www.ctahr.hawaii.edu/freepubs>.

Diseases



Anthracnose, *Colletotrichum gloeosporioides* (fungus). Tiny, dark necrotic spotting of individual flowers on the spadix.



***Sphaerobolus stellatus* (fungus).** Tiny, dark brown to black spots scattered over the flower surface resulting from spore masses (gleba) forcibly “shot” from the fungus growing in the soil on decomposing organic matter.



Superficial fungus. This unidentified greyish-brown fungus is often found growing on the surface of the spadix, probably on exuded nectar.



Bacterial blight, *Xanthomonas campestris* pv. *Dieffenbachiae*. Bacterial blight on flowers is uncommon except in fields with high infestations. Infected areas are usually purple to black, blotchy and necrotic. Small, dark necrotic spots on the spadix that resemble anthracnose may also occur. When flowers are systematically infected, their vascular systems are usually dark and may be visible externally. The symptoms of a systematically infected flower usually affect the spathe near the petiole and spadix.

Insects, Mites, Slugs, and Birds



Thrips, *Chaetanaphothrips orchidii* (Moulton) and *C. signipennis* (Bagnall). White streaks and distortions appear on the upper or lower surfaces of the spathe. The injury begins on young developing flowers during the bud stage.



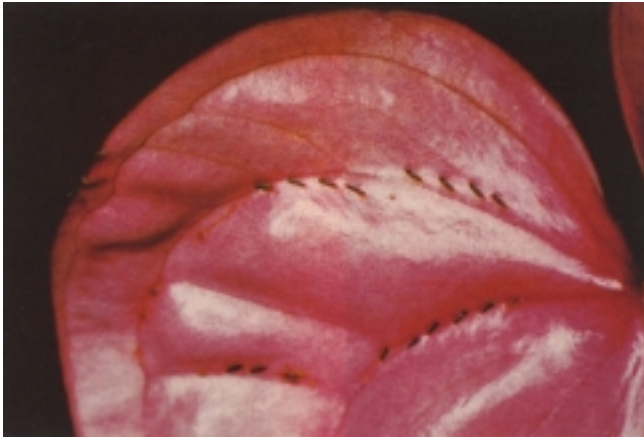
The adult thrips is about 1/25 inch long and has a yellow body with banded wings.



Whiteflies, *Aleurotulus anthuricola* Nakahara. Identified by white, powdery, waxy secretions and black pupae under the leaf sheath. Pupae may be found on the spathe in severe infestations.



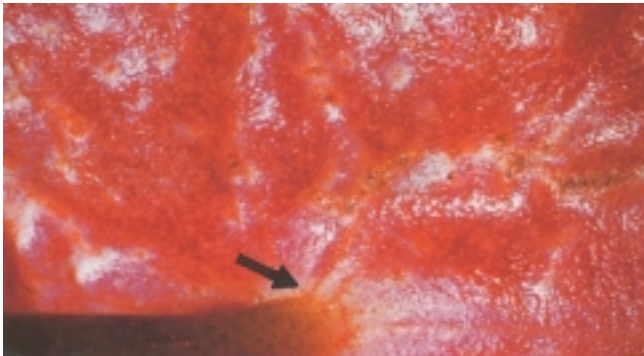
The adult whitefly is about 1/25 inch long with white wings and a yellow body.



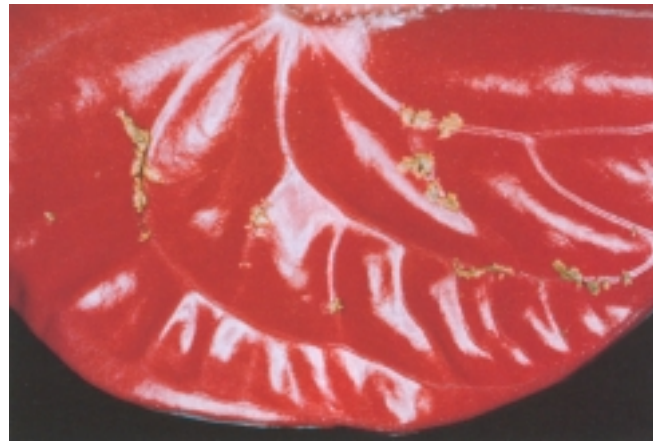
Grasshopper/katydid oviposition wounds. An oviposition puncture is on the flower spathe. Numerous dark, torpedo-shaped eggs are laid in sequence along the flower veins in a stitching pattern.



Slugs. Brownish necrotic markings on the spadix are caused by the feeding of the slug



Red and black flat mite, *Brevipalpus phoenicis* (Geijskes). Bronzing of the petiole and lower surface of the spathe. Bronzing of the upper surface does not occur except in severe infestations.



Grasshoppers/katydids. Chewing insects can cause feeding injury on the upper surface of the spathe



Adult mites are about 1/100 inch long and reddish with black patterns.



Birds. Several birds are known to cause holes in the spathe and injury to the spadix while feeding on grasshoppers. Bird injury is more common with anthuriums grown under hapu'u or other shade trees.

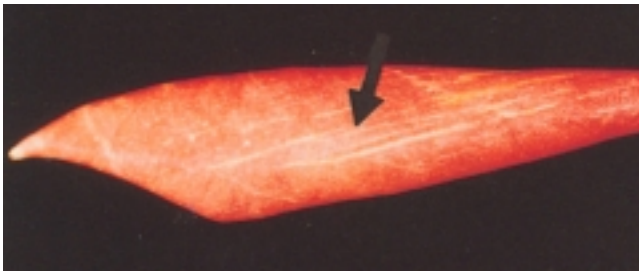
Mechanical, Physiological and Environmental Injury



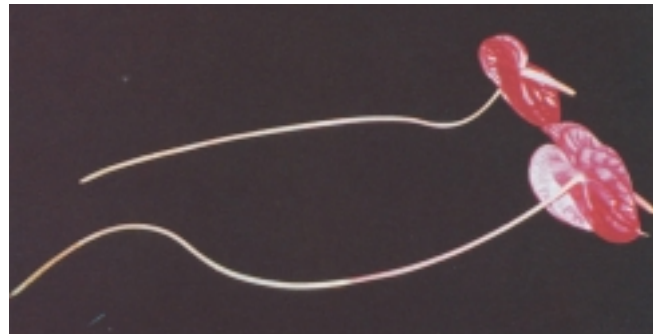
Mechanical injury. The major type of flower injury is caused by harvesters, spray equipment, wind, and heavy rain dripping along seams of shade cloth. The injury is variable but often characterized by bruised, torn, scratched, or creased spathes and spadices.



Sunburn. Overall fading of the spathe color (see smaller flower) or browning of the spadix caused by direct sunlight, light shade levels, and flower age. Larger flower shows normal color.



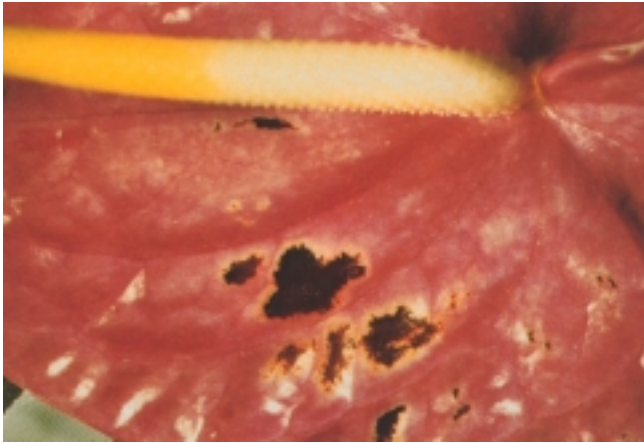
Mechanical injury. Scratches on flower buds are caused by abrasion during recindering, harvesting, or wind movement among leaves and flowers.



Crooked stems. The suspected cause of curved petioles is an environmental-physiological interaction involving excessive nitrogen feeding and fluctuating wet and dry conditions. Heavy shade levels and a lack of pruning may also contribute to crooked stems.



Mechanical injury. "Pele's hair" causes mechanical punctures or abrasions on both the spathe and spadix; shown is injury to the spadix.



Phytotoxicity. Incorrect fertilizer, sticker, or pesticide application rates or methods can cause necrotic or distorted areas on the spathe.



Deformed spathes. The spathe may also be wrinkled or curled as shown on these 'Kozohara' flowers. Deformed spathes can be caused physiologically by physical and chemical damage early in the development of the flowers.



Deformed spathes. The suspected cause is an environmental-physiological interaction. In this example, the 'Ozaki' spathe has elongated to an obake shape.



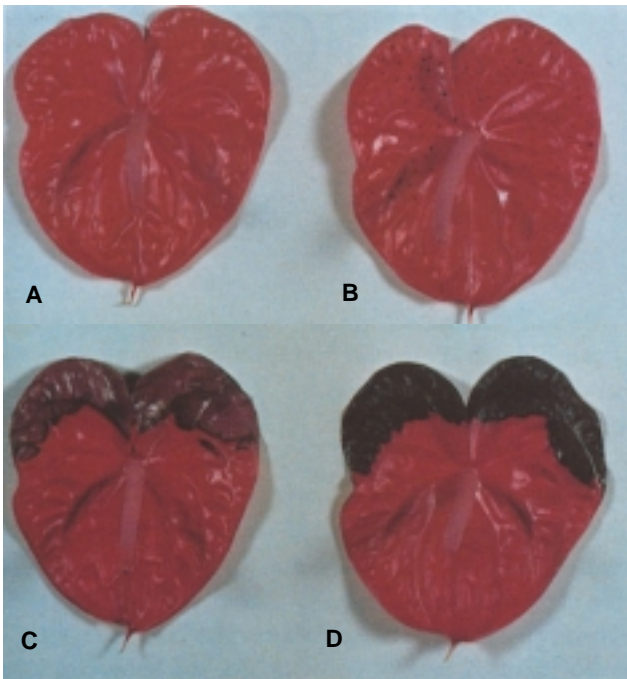
Bleach. In mild cases, impaired color development occurs in the lobe area of the spathe, and in severe cases the entire flower including the spadix may show signs of insufficient color development, stunting, distortion, and necrosis. The suspected cause of bleaching is an environmental-physiological interaction involving excessive applications of ammonium nitrogen, excessive salt buildup, and fluctuating low and high temperatures.



Chimeras. These can be recognized by color breaks, which may or may not be accompanied by distortion of the spathe. The suspected cause of chimeras is genetic mutation within the spathe.



Deformed spadix. Crooked or shortened spadixes are thought to be caused by an environmental-physiological interaction such as experienced during transplant shock. Shortening of the spadix often occurs along with the 'Ozaki'-obake conversion.



Calcium deficiency. A nutritional disorder characterized by water-soaked lesions that eventually become necrotic, first occurring on lobes of the spathe and gradually advancing or spreading. Flower A is normal and flowers B through D are successively more deficient.



"Vog" (volcanic smog) spotting. Purple spots that later turn whitish, appearing randomly on the flower spathe result from sulfur dioxide gas emitted during volcanic eruptions and taken in through stomates, causing a localized internal "burn."