

# Ficus branch canker of Indian laurel-leaf fig

Joey S. Mayorquin, A. James Downer, Donald R. Hodel, Angela Liu, and Akif Eskalen

**I**NDIAN LAUREL-LEAF FIG (*Ficus microcarpa* – often grown as *F. nitida*) is an attractive ornamental tree found mostly outdoors, and is frequently encountered along city streets lining parkways, medians, and sidewalks. *F. microcarpa* is particularly susceptible to a disease previously known as ‘Sooty Canker’, which was believed to be caused by the fungus *Nattrassia mangiferae* (synonym *Hendersonula toruloidea*), which has undergone a recent taxonomic revision to *Neofusicoccum mangiferae* (1, 2) (Fig 1, 2).

*Neofusicoccum* represents an anamorph (asexual state) genus of *Botryosphaeria*. A recent survey in southern California of *F. microcarpa* showing symptoms of branch canker and dieback, resulted in the recovery of a number of *Botryosphaeria* spp., specifically *Botryosphaeria dothidea*, *Neofusicoccum luteum*, *N. mediterraneum*, and *N. parvum*. *N. mangiferae* was not recovered from any of the samples. Pathogenicity tests showed

each species to be pathogenic on *F. microcarpa*.

Members of the Botryosphaeriaceae family represent an important group of canker-causing fungi, often involving a complex of species. *Botryosphaeria* spp. are known to occur on a variety of woody hosts, including important agricultural crops such as grapevine, avocado, citrus, and pistachio. Moreover, these species are known to occur on a variety of gymnosperms and, in California alone, *B. dothidea* has been found on at least 40 hosts belonging to the Fabaceae, Juglandaceae, Rosaceae, Myrtaceae, Oleaceae, and Pinaceae, to name a few

(5). This emphasizes the importance of the cosmopolitan distribution of these pathogens. Symptoms often include twig dieback and branch and root cankers with slightly sunken areas that may be visible on affected tissues. Infected sapwood appears gray to black and is distinct from the lightly colored healthy wood (Fig 3). Fungal fruiting bodies (perithecia and pycnidia), representing the sexual and asexual stages, respectively, of the fungus may also be present. These structures produce the infective spores and appear as tiny black bumps (blisters) that protrude from the bark in or around the canker tis-

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Figure 1. (Left) Healthy ficus tree (left) near a severely declining tree.

Figure 2. (Right) Localized dead patch in crown with progressive branch dieback.







**Figure 3. Cross-section of cankered branch.**

sue, as well as on surrounding dead bark and twigs (Fig 4). Fungal spores are a source of natural inoculum and are often disseminated by rain, wind, pruning tools, etc. Spore trapping studies have shown an increase in spore dispersal during or soon after a rain event (4). Pruning wounds serve as a primary site for pathogen invasion, but other injuries including root pruning, sunburn, freeze, insect, and mechanical damage can create points of entry for fungal spores.

On *Ficus microcarpa*, symptoms initially begin with slightly discolored leaves and crown thinning often restricted to a particular branch. As the disease progresses into the canopy, twig and leaf dieback is observed and eventually branch dieback will follow, resulting in dead patches in the crown (Fig 3). If the disease progresses into the trunk or roots, the tree will eventually die (Fig 1) (2).

*Ficus* branch canker can be managed by implementing strategic cultural practices, but other management strategies could be used in conjunction with those cultural practices. *Botryosphaeria* often exerts its virulence during times of plant stress, therefore maintaining tree health through proper fertilization based on soil analysis and sufficient irrigation, can be a first line of defense in disease management. It is important to note that because many *F. microcarpa* in California are closely planted, competition for available resources is typically high. In addition, much of the natural precipitation is diverted by the pavement and other hardscape that often covers much of their root zones. Many are also subjected to

extensive root and shoot pruning necessary to maintain them in urban settings (2). This type of severe pruning should be minimized because it can increase the trees' susceptibility to pathogen infection. Pruning during dry weather and good sanitation practices of pruning tools can help reduce the risk of fungal spore transmission to pruning wounds. For this reason, the use of chainsaws is discouraged because they cannot be adequately disinfected. Also, if the disease is caught early on, diseased branches can be pruned out and properly disposed of to minimize spread to other parts of the tree as well as to surrounding trees. Although there is a continuing trend for more environmentally responsible practices, fungicides could be used to manage the disease. Chemical treatment of pruning wounds has been evaluated for other plant species and trials are being conducted for the management of avocado branch canker (4).

Recommended cultural practices to minimize infection include:

- Avoiding pruning during wet conditions (rain, dew, fog, overhead irrigation, etc.)
- Pruning cankered limbs at least five inches below the infection site. Fresh wounds can be treated with a fungicide to reduce the incidence of severity of canker development; a qualified pest control adviser should be consulted before applying any treatments.
- Pruning dead limbs and twigs that carry pycnidia and perithe-

**Figure 4. Close-up of fruiting bodies embedded within the bark of a cankered branch.**



- cia (spore-forming structures).
- Sterilizing pruning tools with either 25% household bleach solution, Lysol® cleaning solution, 70% EtOH (ethyl alcohol), or by flame with a hand torch.
- Proper disposal of pruned branches from sites.

**Joey S. Mayorquin**  
Department of Plant Pathology  
and Microbiology, University of  
California, Riverside, CA

**A. James Downer**  
University of California Coopera-  
tive Extension, Ventura County CA

**Donald R. Hodel**  
University of California Coopera-  
tive Extension, Los Angeles, CA

**Angela Liu**  
Consulting Arborist, Mar Vista, Los  
Angeles, CA

**Akif Eskalen**  
Corresponding author: Email: aes-  
kalen@ucr.edu

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