Influence of climate on canker disease in the Proteaceae of the Southwest Australian Floristic Region

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The incidence and severity of plant canker diseases caused or associated with fungi and other endophytes has been steadily increasing worldwide. Climate change is seen as the driving force in the apparent emerging pathogenicity of these normally minor diseases. The contribution of canker to stem and branch death in the Southwest Australian Floristic Region (SWAFR) is poorly documented and understood. *Banksia verticillata* and *Lambertia orbifolia*, both *Threatened* and endemic to the SWAFR, are currently being severely impacted by canker disease. Transects were established in populations of *B. baxteri*, *B. coccinea, B. verticillata* and *L. orbifolia* populations to quantify and monitor canker severity and impact, with 1,620 individuals assessed across 32 sites. Climate as interpolated rainfall, temperature, humidity, and actual temperature and humidity data for sites covering the northern and southern rainfall extremities were used for comparison against canker impact scores in an attempt to develop predictive ability in climate change scenarios. The most frequently isolated pathogenic canker fungi were in the *Botryosphaeria* complex, a putative *Zythiostroma*, *Cryptodiaporthe* and *Cytospora* spp. respectively. All except *Cytospora* spp. have been isolated at a low level from healthy asymptomatic tissue suggesting that they have some degree of benign endophytic role and that the environment is shifting the host-pathogen relationship to a more aggressive one. Co-occurrence of several of the pathogens in single canker lesions demonstrates a synergism in canker disease expression that will impact the distribution of some proteaceous species in the SWAFR. Systemic fungicides were also investigated as control options for the four main canker fungi as part of an integrated pest management approach.

Program and Abstracts

Australasian Systematic Botany Society Conference 2012

Local knowledge, global delivery

23–28 September, Perth, Western Australia

ASBS 2012
CONFERENCE PERTH