

A blight on our gums?



Three suckers sprouting from the base of a dead chestnut tree in America. The central one is already infected; its bark is cracked and the small orange spots are where the fungus is making spores.

All plants suffer from the attentions of disease-causing parasites that seek a living at their expense. However, in most cases the war between parasite and host has been going on for millions of years and long ago reached a stalemate — with individuals of both dying, but each species as a whole continuing to survive.

But from elsewhere in the world can come diseases against which natives have evolved no protection; and Australia, having been isolated for so long, is particularly vulnerable in this regard.

Our eucalypts suffer from various fungi (and fungal

cankers may provide the *coup de grâce* for trees stricken with dieback — see *Ecos* 62), but recent work by Dr Ken Old of the CSIRO Division of Forestry and Forest Products has indicated that a fungus now found in much of the Northern Hemisphere can also infect eucalypts, posing an unknown degree of threat to the health of our native forests.

While working in Japan in collaboration with Dr Takeo Kobayashi, Dr Old found some eucalypts there that were infected with an organism that he identified as *Cryphonectria parasitica*, the chestnut blight fungus. (The parasite also goes under the name of *Endothia parasitica*.)

As well as chestnut trees, it attacks oaks in Europe, North America, and Japan, gaining entry through wounds caused by insect attack, wind damage, or twig breakage. The fungus spreads when wind or water droplets disperse its light spores.

Dr Old and Dr Kobayashi took samples from cankers in eucalypts and chestnuts in the field. Back in the laboratory, they managed to isolate and grow the fungus on agar. They then potted a number of seedlings of five species of eucalypt to use as experimental subjects, inoculating them with small quantities of the fungus in a nutrient mixture when the trees reached about 1 metre in height.

Twelve weeks later, trees of all five species had developed cankers ranging in length from 22 to 75 mm. Although no trees actually died during this time, the stems of many were severely damaged, with the bark cracking and sloughing off. Along the edge of the

cankers the parasite grew as a white fan. To test that it was the same as the one they had inoculated, the scientists grew it in the laboratory, and it was indeed *C. parasitica*.

Furthermore, they inoculated some eucalypts with a control solution lacking any fungus. Although some lesions developed in this case, they were far smaller than those induced by the pathogen, and they stopped growing after 4 weeks.

Incidentally, the scientists found that some fungi had colonised the wounds of these inoculation sites — as would be expected, for fungi are everywhere — but they were not of a particularly pathogenic species, and the trees could cope with them. It was only the chestnut blight fungus that caused large and continually spreading cankers.

Whether that fungus would have killed the eucalypts had the experiment proceeded for longer we don't know. Other stresses, of course, also play a part in determining whether



A large canker on a young *Eucalyptus camaldulensis* tree, experimentally infected with the chestnut blight fungus by Dr Old in Japan.

the parasite or the host plant gains the upper hand.

The importance of Dr Old's work lies in the fact that it has identified a possible threat to eucalypts grown in many parts of the world. Although the chestnut blight fungus is not found naturally in Australia, its range may correspond, in parts, with areas where eucalypts may be used in future plantation forestry.

We may feel safe 'down under', but history has shown that pathogens can enter all too easily.

If the fungus does take hold here, Dr Old does not expect all our trees to die; rather, he predicts a range of differing susceptibilities across the 600 or so species of eucalypts. Nobody knows which would die and which remain unaffected.

The salinity, insect attack, and pathogens from which many of our trees already suffer could exacerbate the effect of the introduced fungus. And don't forget that plenty of chestnut trees also grow here.

Dr Old stresses the need to maintain our vigilance: don't bring back any nuts or cuttings from that spreading chestnut tree that has grown for

centuries in the village in Europe where your relatives live, or we may lose more than just our chestnut harvest.

Roger Beckmann

Eucalypts are susceptible to the chestnut blight fungus, *Cryphonectria parasitica*. K.M. Old and T. Kobayashi. *Australian Journal of Botany*, 1988, **36**, 599-603.