

Tuesday 23 February 2010
Attention chiefs of staff, news directors

FOREST SCIENTISTS' RESPONSE TO CLAIMS THAT FORESTRY TREES ARE LINKED TO TOXIC WATER IN NORTH-EASTERN TASMANIA

Concerns have been raised in recent media reports and on the ABC's *Australian Story*, suggesting that contamination of Georges Bay is due to chemicals derived from genetically altered *Eucalyptus nitens* plantation trees located in the catchment. There have been many incorrect assumptions and tenuous connections raised which may have lead to unnecessary public concern.

No eucalypt plantations in the catchment, or anywhere else in Australia, use trees altered through genetic engineering. The *E. nitens* trees in the plantations would have been grown from naturally pollinated seed produced in seed orchards, which incorporate first- or second-generation descendents from wild populations of *E. nitens* occurring in Victoria or southern NSW. The trees in the seed orchards have been selected in field trials for their superior growth and wood quality. They have not been selected for increased toxicity. The *E. nitens* trees growing in plantations in the Georges River catchment would be genetically very similar to those that occur in the native forests that shed water into Melbourne's reservoirs and other river catchments in Victoria and NSW.

Statements have been made concerning the relative toxicity and greater foam production from *E. nitens* leaves sampled from genetically improved plantations compared with leaves from natural old-growth forests. While we do not know the full details of the sampling involved, it is important to note that eucalypt leaf chemistry changes markedly from the juvenile stage (as was apparently sampled in the plantations) to the adult leaves sampled in the native forests. Leaf chemistry also changes seasonally and is influenced by the growing environment, so at this point it is incorrect to conclude that the plantation trees are genetically more toxic.

The ABC program implied chemicals leaching from the leaves of trees in the *E. nitens* plantations flow on the surface of the river and their accumulation in Georges Bay has been responsible for human health problems and deaths of oysters. However chemicals from native vegetation occur in waterways throughout Tasmania naturally, as evidenced by the dark brown river waters of Tasmania's World Heritage Area. There are many catchments where *E. nitens* occurs, either naturally or in plantations across Australia. No evidence has come to light suggesting that this particular tree has any atypical effect on aquatic life compared with other eucalypt species. Due to public concerns, closer examination is warranted, and this issue can be resolved with well designed studies.

Eucalypts are the dominant trees of our native woodlands and forests. Many of the chemicals that naturally occur in eucalypts are toxic to some organisms in sufficiently high concentrations. The original Analytical Services Tasmania laboratory study in February 2005 identified several surface or foam samples which were toxic. Of the chemicals assayed in the toxic samples, the major ones, including cineole, are well

recognised components of eucalypt oils. While toxic if swallowed in its concentrated form, eucalypt oil is widely used in medications around the world as an inhalant and a skin-rub.

Chemicals that the Analytical Services Tasmania laboratory identified in the toxic samples occur not only in *E. nitens* foliage but in that of many of the native eucalypts including *E. globulus*, *E. ovata* and *E. viminalis* which occur in the vicinity of Georges Bay. Cineole is the dominant component of the leaf oils of the majority of Tasmanian eucalypt species. There are many other chemicals which can be monitored, even at very low levels, to determine whether they further contribute to the toxicity reported and may be more specific to the Georges Bay situation and *E. nitens*. There are also natural plant chemicals which are known to cause foaming when shaken in aqueous solutions.

We expect these eucalypt chemicals to degrade *in situ* as well as move into soils and waterways to some extent through litter fall and leaching. Trees may naturally affect local aquatic ecosystems in many ways. Leaf and other organic litter from eucalypts is a major basis for the food chain in nearly all Australian stream ecosystems, often providing the main source of carbon for the invertebrates and ultimately fish in forested catchments. Eucalypt leaves in streams are eaten, usually after a period of breakdown by bacteria and fungi, by a wide variety of aquatic insects and crustaceans which have evolved to be dependent on this food source. The chemicals in eucalypt leaves are broken down and released continually through this process in thriving, healthy stream ecosystems.

We have a lot to discover about the diverse natural chemicals in our native flora, including eucalypts. We applaud any vigilance in the interests of public health or environmental integrity, and acknowledge the valuable role played by concerned members of the public, and the media, in keeping these matters in the public eye. However, it is important that future studies are designed and conducted in a scientifically rigorous way. Scientists at the University of Tasmania, CSIRO and the CRC for Forestry have all indicated their willingness to participate in future investigations.

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