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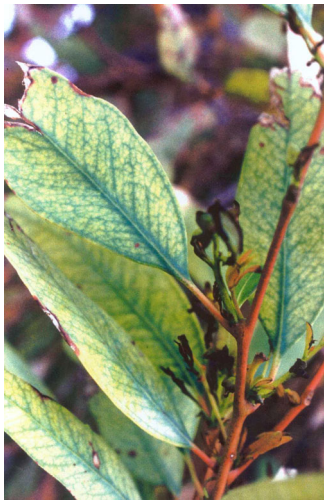
MUNDULLA YELLOWS

Finding the cause of a new disease when there is no easily recognisable primary pathogen can be a lengthy process. Possible agents must be critically evaluated and many are eventually eliminated as information steadily accumulates. One such disorder is Mundulla yellows, a mysterious ailment of many species of eucalypts and some other species of native flora in Australia. Symptoms are expressed as a progressive yellowing of the foliage followed by dieback of the crown, and eventually the death of badly affected trees. Leaves exhibit a characteristic interveinal yellowing or chlorosis, which usually starts in the new growth and spreads to older leaves. These symptoms often begin on a single branch before spreading to multiple limbs. New, initially healthy, recovery shoots (referred to as epicormic 'panic' growth) may be produced within the tree crown, and this is followed by reduced flowering and seed set. Progression through the various stages may take several years or even decades, ending ultimately in extensive dieback and tree death.



Foliage symptoms of Mundulla yellows
(*supplied by Ian Smith*)

Mundulla yellows is acknowledged as a real threat to the natural biodiversity of many wildlife habitats in Australia. It was named after the town of Mundulla in South Australia where it was first described in 1975, but symptoms have now been found in all States. Since investigations into the disease began fungi, bacteria, and nematodes have all been eliminated as the cause of the problem. Researchers then turned their attention to microscopic agents that cannot live or replicate outside the host plant, such as viruses, viroids (virus-like agents), and phytoplasmas (minute bacteria-like micro-organisms lacking a normal cell wall), and it was soon discovered that a viroid was frequently present within the affected leaf tissues. However, such an association is not proof, and to establish that an agent present within the host is the actual cause of a disease requires a rigorous series of steps to test its virulence or pathogenicity. In the case of Mundulla yellows different groups of researchers have reported a variety of results and the role of this viroid in the development of the disease remains a matter of contention. Other possible causes have been considered, including the likelihood that the symptoms may develop after the roots on affected trees have absorbed certain herbicides applied to control weed growth. One multidisciplinary

Eucalypt affected by Mundulla yellows
(*source: Department of Conservation and Land Management publication, Government of Western Australia*)

group of researchers in Victoria and South Australia have identified some factors common to sites associated with the disorder. They found a strong and consistent relationship with high pH alkaline soils, low levels of iron and manganese in the soil and plant, and high rates of carbonates and chloride in the foliage. They postulate that habitat modification may be the primary cause of the condition. Many parts of Australia are experiencing serious vegetation problems due to increased soil salinity. This is a result of rising water tables following the change from the natural landscape of woodlands and shrublands to pasture and agriculture. Thus 30 years after the recognition of Mundulla yellows as a new disease the definitive cause or causes have not been unequivocally established. Research is continuing but it may still be some time before there is a final answer to the cause of Mundulla yellows.

For further information, visit sites such as:
http://www.deh.gov.au/biodiversity/invasive/publications/mundulla-eucalyptus/
http://www.burkesbackyard.com.au/1999/archives/25/in_the_garden/weeds_and_garden_pests?p=2394

(*Margaret Dick, Forest Research, from information provided by Ian Smith, Department of Sustainability and Environment, Forest Pathology, Heidelberg, Victoria, Australia*)

PAT CRANE

Dr Patricia Crane has recently arrived from Edmonton, Alberta, Canada, to join the Forest Biosecurity and Protection Unit of Forest Research as a postdoctoral scientist. Her graduate studies were done jointly at the University of Alberta and the Northern Forestry

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Web site < http://www.foresthealth.co.nz>

Centre of the Canadian Forest Service. Her previous work has encompassed both traditional forest disease research and basic studies of the biology and taxonomy of fungi that cause tree diseases. For her Master of Science, she investigated the cause and anatomy of large stem galls on *Populus tremuloides* and their relationship to wood decay. Her doctoral research focused on mycology, specifically the basic biology and relationships worldwide among fungi causing spruce needle and cone rust diseases. Because these rust fungi often have *Rhododendron* species as alternate host plants, she also described several new rust fungi infecting those hosts in Asia. Besides these contributions, she has participated in projects to screen *Pinus contorta* for resistance to western gall rust, to assess the danger of poplar leaf rust diseases to plantation forestry in central Alberta, and to determine some of the factors that influence the level of spruce cone rust disease in seed orchards.

While in New Zealand, she intends to apply her interests in the basic biology and ecology of forest disease fungi to a stem disease of radiata pine. This disease causes stem malformations that are associated with stain and decay of the wood and make it unsuitable for solid-wood products. The causal agent is thought to be the fungus *Nectria fuckeliana*, which appears to enter the stems through wounds such as pruned branch stubs. Her goal will be to prove the relationship between the fungus and the disease and to answer some basic questions about the fungus: Can it infect living wood? How do the spores spread? What conditions cause the fruiting bodies to form? How does the fungus grow in the wood and how does it damage the cells? The answers to such questions will aid the forest industry in devising management strategies to minimise the effects and spread of the disease.

NECTRIA PROJECT

The article on the Nectria research programme published in the previous issue of *FH News* contained photographs of a severely fluted tree and a whorl section showing extensive stain and decay. Both photographs were typical of severe symptoms, but we do not want to give the impression that severe symptoms are common and widespread in the region. Recent surveys have indicated that the incidence of such infection is low. We should also clarify that the section shown was decayed by other fungi that invaded the tissue after infection by *Nectria fuckeliana*.

NEW EDITOR

This issue of *Forest Health News* heralds an important change. For the past 4 years Ian Hood has been the editor of *FH News* but now John Bain takes over this role. He does so with some trepidation as Ian, and the editors before him, have consistently produced a very readable and informative newsletter. *FH News*, which began in 1991, was initially aimed primarily at an internal audience but now goes out to 276 people including 23 overseas. The editor welcomes ideas from readers about topics that they would like to see covered in the newsletter.

NEW RECORDS

New to New Zealand record – Fungus: *Hysterographium fraxini*; **Bioregion:** South Canterbury; **Host:** *Fraxinus excelsior*; **Coll:** B Doherty, 06/12/2004; **Ident:** P Gadgil, 09/12/2004; **Comments:** This European species is generally recorded as a non-specialised, facultative saprophyte. The fruiting bodies are found on dead twigs.

New distribution record for New Zealand – Fungus: *Valsaria rubricosa*; **Bioregion:** Hawke's Bay; **Host:** *Pinus radiata*; **Coll:** B Rogan, 18/11/2004; **Ident:** M Dick, 07/12/2004; **Comments:** This saprophytic fungus has previously been recorded from Bay of Plenty, Gisborne, Taupo, and Buller.

New distribution record for New Zealand – Fungus: *Uromycladium alpinum*; **Bioregion:** Mid Canterbury; **Host:** *Acacia mearnsii*; **Coll:** B Doherty, 15/12/2004; **Ident:** M Dick, 20/12/2004; **Comments:** This fungus is widespread in the North Island but had only been recorded in the north of the South Island. It has caused significant losses in nursery seedlings in Auckland and Northland. Dieback of older trees has been recorded in some areas.

New distribution and new host record for New Zealand – Fungus: *Hysterographium fraxini*; **Bioregion:** Nelson; **Host:** *Fraxinus angustifolia*; **Coll:** B Doherty, 24/12/2004; **Ident:** M Dick, 12/01/2005; **Comments:** This European species is generally recorded as a non-specialised, facultative saprophyte. The fruiting bodies are found on dead twigs. It has previously been recorded from South Canterbury.

New distribution record for New Zealand – Fungus: *Hysterographium fraxini*; **Bioregion:** Wellington; **Host:** *Fraxinus* sp.; **Coll:** I Veljkovich, 20/01/2005; **Ident:** M Dick, 02/02/2005; **Comments:** This European species has previously been recorded from South Canterbury and Nelson.

New host record for New Zealand – Fungus: *Linochora aberrans*; **Bioregion:** Wellington; **Host:** *Pachystegia minor*; **Coll:** B Rogan, 12/12/2004; **Ident:** J Gardner, 15/12/2004; **Comments:** This fungus causes a spectacular leaf blotch on the host. This is only the third record of this species from New Zealand.

New distribution record for New Zealand – Insect: *Acizzia dodonaeae* (Psyllidae); **Bioregion:** Northland; **Host:** *Dodonea viscosa*; **Coll:** D Satchell, 24/11/2004; **Ident:** J Bain, 29/11/2004; **Comments:** This psyllid is restricted to *D. viscosa* and is probably widespread throughout New Zealand.

New distribution record for New Zealand – Insect: *Peltoschema* sp. (Chrysomelidae); **Bioregion:** Bay of Plenty; **Host:** *Acacia decurrens*; **Coll:** J Bartram, 21/12/2004; **Ident:** D Jones, 21/12/2004; **Comments:** This undescribed Australian species has previously been recorded from Auckland, Gisborne, and Wellington.

New distribution record for New Zealand – Insect: *Anisoplaca cosmia* (Gelechiidae); **Bioregion:** Bay of Plenty; **Host:** *Lagunaria patersonii*; **Coll:** B Rogan, 19/01/2005; **Ident:** D Jones, 21/12/2004; **Comments:** This introduced species has previously been recorded from Auckland, Gisborne, and Hawke's Bay.

New distribution record for New Zealand – Insect: *Stigmella microtheriella* (Nepticulidae); **Bioregion:** Bay of Plenty; **Host:** *Corylus avellana*; **Coll:** M Redpath, 24/01/2005; **Ident:** J Bain, 02/02/2005; **Comments:** Until 2000, when it was found in South Canterbury, this introduced leaf miner was known from only two locations in Nelson.

New host record for New Zealand – Insect: *Ctenopseustis obliquana* (Tortricidae); **Bioregion:** Wellington; **Host:** *Rhaphiolepis umbellata*; **Coll:** B Rogan, 12/12/2004; **Ident:** D Jones, 16/12/2004; **Comments:** This native leaf-rolling caterpillar has a very wide host range.

New host record for New Zealand – Insect: *Acrocercops alysidota* (Gracillariidae); **Bioregion:** Wellington; **Host:** *Acacia notabilis*; **Coll:** B Rogan 14/12/04; **Ident:** D Jones, 16/12/2004; **Comments:** This Australian species has been recorded from several species of *Acacia*.

New host record for New Zealand – Insect: *Hylurgus ligniperda* (Curculionidae); **Bioregion:** Bay of Plenty; **Host:** *Pinus taiwanensis*; **Coll:** J Bartram, 21/12/2004; **Ident:** D Jones, 22/12/2004; **Comments:** This European species is found in a wide range of *Pinus* spp.

New host record for New Zealand – Insect: *Psepholax sulcatus* (Curculionidae); **Bioregion:** Bay of Plenty; **Host:** *Pinus taiwanensis*; **Coll:** J Bartram, 21/12/2004; **Ident:** J Bain, 22/12/2004; **Comments:** This native species bores in a wide range of dead and dying trees.

New host record for New Zealand – Insect: *Hemiberlesia rapax* (Diaspididae); **Bioregion:** Mid Canterbury; **Host:** *Asterotrichion discolor;* **Coll:** B Doherty, 15/12/2004; **Ident:** R Henderson, 22/12/2004; **Comments:** This cosmopolitan species has a very wide host range.

New host record for New Zealand – Insect: *Aspidiotus nerii* (Diaspididae); **Bioregion:** Mid Canterbury; **Host:** *Asterotrichion discolor;* **Coll:** B Doherty, 15/12/2004; **Ident:** R Henderson, 22/12/2004; **Comments:** This cosmopolitan species has a very wide host range.

New host record for New Zealand – Insect: *Ceroplastes sinensis* (Coccidae); **Bioregion:** Auckland; **Host:** *Hymenosporum flavum;* **Coll:** C Scott, 21/01/2005; **Ident:** D Jones, 27/01/2005; **Comments:** This introduced species is found in most regions in the northern half of the North Island. It has a wide host range.

New host record for New Zealand – Insect: *Saissetia coffeae* (Coccidae); **Bioregion:** Auckland; **Host:** *Hymenosporum flavum;* **Coll:** C Scott, 21/01/2004; **Ident:** D Jones, 27/01/2005; **Comments:** This tropicopolitan species has a very wide host range.

(*John Bain, Forest Research*)