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JUNGHUHNIA SPREADS BY SPORES

Earlier this year dead and dying trees were noticed scattered throughout a young stand of *Pinus radiata.* The affected site was on the coastal lowlands in the Bay of Plenty region.

It was initially assumed that the cause of the mortality was armillaria root disease, but closer inspection failed to reveal any of the characteristic signs of infection (mycelial fans and rhizomorphs). A number of the affected trees were sampled, and isolations from the roots and root collar zone all yielded cultures of the basidiomycete fungus *Junghuhnia vincta* (synonyms, *Poria vincta*, *Rigidoporus vinctus*).

Identification was confirmed by the presence of two fructifications in different stages of development, each situated just above soil level at the base of an infected tree.

J. vincta is well known as a root disease pathogen in New Zealand (see *Forest Pathology in New Zealand 18* (1987) – available on our website) and in other parts of the world, more so in the tropics and sub-tropics. It is noteworthy that records in this country often, but not exclusively, come from warmer sites in the northern half of the North Island.

The disease appears relatively unimportant, being encountered infrequently, and with deaths occurring only singly or in small groups. Nevertheless, a variety of tree and shrub hosts are attacked in forest plantations, shelterbelts, ornamental plantings and home gardens.

In pine plantations *J. vincta* was first recognised as a minor problem in the coastal Bay of Plenty region in the 1980s, and it has since been found at other locations. Symptoms in young pine trees are superficially similar to those in trees infected by *Armillaria* species, but foliage discoloration and death tend to be irregularly distributed across the crown and even within the same branches. Longitudinal sunken grooves or depressions may be present running part way up the stem from the root collar. *J. vincta* occurs naturally as a decomposer of woody debris within native forests.

The affected pine stand observed earlier this year had replaced a plantation of *Eucalyptus nitens* which was, itself, established on a site that had previously been

Above: Trees dying from junghuhnia root disease in the young *Pinus radiata* stand that replaced a plantation of *Eucalyptus nitens*.

*Newsletter of the **Scion Forest Protection team**, and the **Forest Health Reference Laboratory** (incorporating the Forest Research Mycological Herbarium (NZFRI-M), the Forest Research Culture Collection (NZFS), and the National Forest Insect Collection (FRNZ). Edited by John Bain, New Zealand Forest Research Institute Ltd, Private Bag 3020, Rotorua. <john.bain@scionresearch.com> Web site < http://www.ensisjv.com/biosecurity >*

farmland, devoid of woody material. This suggested that *J. vincta* had colonised the *E. nitens* stumps by means of basidiospores, from which it had then grown vegetatively along the roots to infect the young pine trees.

Spores are believed to be important for the spread of *J. vincta* in plantations of *Araucaria cunninghamii* (hoop pine) in Queensland (L. Bolland, pers. comm.). To test this idea, an isolate of *J. vincta* was cultured from each of 10 diseased trees distributed over an area 500-600 m across in the young radiata pine stand. The 10 isolates were then paired on agar growth medium in the laboratory in all possible combinations.

With one exception, all pairings produced a barrier zone of incompatibility where the two expanding cultures met, indicating that the isolate from each tree was genetically different from those in the other trees. However, the isolates from two trees merged evenly without forming a barrier zone, signifying that they may have originated as identical mycelia from the same spore source. These two trees were situated near each other and it is possible that each had become infected by mycelium growing from within the same eucalypt stump. When self-paired, cultures also all merged uniformly, and the same result occurred in pairings of two isolates from a single tree, one taken from the mycelium of a fruitbody present at the base.

These results support the view that numerous, small, root disease centres become established by means of basidiospores that disperse from fruitbodies of *J. vincta* produced naturally in nearby reserves of indigenous forest. Indirect evidence indicates that *Armillaria novae-zelandiae* also spreads and sets up new infection centres by means of basidiospores (see *Forest Health News 142*:1 (2004) – available on our website). Why, then, were the trees examined in this stand only infected by *J. vincta*?

It may be that *J. vincta* has a propensity to release spores more prolifically over longer periods that possibly differ from those of *A. novae-zelandiae*, which disperses its spores mainly during winter (May and June). It is believed that the previous *E. nitens* stand was felled during summer, so that by the time the stumps were exposed to spores of *A. novae-zelandiae*, they would have already been well colonised by other wood decay fungi, including presumably *J. vincta*. Perhaps stumps of *E. nitens* also provide a particularly suitable substrate for spore colonisation?

These suggestions provide a plausible explanation for what was observed in the field, but are nevertheless merely conjectural. Verification awaits a full study of the spore-release and dispersal periodicity of *J. vincta*.

Ian Hood

NEW INSECT FOUND IN HAMILTON

During the course of high risk surveys in Hamilton in May this year an armoured scale insect (Diaspididae) previously unknown from New Zealand was found infesting *Juniperus chinensis.* It is *Carulaspis minima*, a European species that is also established in North and South America, South Africa, Bermuda and Hawaii. Overseas it has been recorded from *Callitris, Cedrus, Cephalotaxus, Chamaecyparis, Cryptomeria, Cupressus, Juniperus, Platycladus, Picea, Sequoia* and *Thuja. Juniperus* appears to be the favoured host.

Heavy infestations can cause premature yellowing and dieback of green needles, branch dieback and even death of the host. In Europe in general it is considered to be a pest of ornamental plantings and in France is considered to be of economic importance. In Bermuda it is regarded a serious pest of *Juniperus bermudiana* as it can damage native forests and affects the tourist industry.

Worldwide there are about 7 species of *Carulaspis.* With one exception all known hosts are conifers. The exception is *C. visci* which is found on *Viscum* (mistletoe).

Another European species of *Carulaspis, C. juniperi*, is established in New Zealand. This species was recorded here in 1942 and has been recorded on a similar range of hosts as *C. minima* and is found throughout most of the country. Although *C. visci* is found on a completely different host it has been confused with both *C. juniperi* and *C. minima. Carulaspis juniperi* was first recorded in New Zealand as *C. visci.*

Thanks to Rosa Henderson (Landcare Research) for identifying *Carulaspis minima.*

John Bain

Above: *Carulaspis* on *Chamaecyparis*. Photo courtesy of forestryimages.org. Microscopic examination is necessary for specific identification.

NEW RECORDS

We are no longer publishing details of new records. For further information on results of MAFBNZ funded programmes see MAFBNZ's Biosecurity magazine (http://www.biosecurity.govt.nz/publications/biosecurity-magazine/index.htm) where information on new biosecurity identifications is regularly published.

John Bain

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