

### **Meripilus: A new perspective**

Of all the wood decay fungi that populate the amenity tree stock, none is more likely than *Meripilus* to prompt the surveyor to prescribe felling as the management recommendation. *Meripilus* is seen as a hostile, parasitic organism, gestating in the living arboreal host with colonisation and resulting decay frequently leading to collapse: a nasty rotter.

However, this may not be entirely deserved: anomalies both in the literature and in the collective body of arboriculturists' experience suggest that windthrow or failure at the stem/root interface may not be as inevitable as is widely supposed.

Whilst *Meripilus* is well known in most fungi ident. books, being chiefly notable for its profuse fructification, one has to turn to specialist arboricultural literature in order to learn much about it.

We know that it is a root decay fungus, that it can cause tree failure, that it can persist in the host for several, possibly many, years prior to fructification, and that it has a specific ability to degrade pectin in woody tissue, thus causing longitudinal delamination of the fibres at a cellular level, as well as being a facultative soft rotter that preferentially attacks xylem rays (in *Fagus*).

We suspect that it is able to infect healthy trees via root grafts, and that it may lead to the development of crown symptoms as root dysfunction progresses. Some practitioners have recorded adventitious root development in infected specimens, and it has even been suggested (though annoyingly I cannot trace the reference) that *Meripilus* infection can by this mechanism sponsor crown rejuvenation in post-mature specimens.

On this latter point, in 1993 I personally subjected a diseased mature *Fagus* in apparent irreversible decline to a 50% crown volume reduction. The subject was jointly infected with *Meripilus giganteus*, *Armillaria mellea*, and *Ganoderma adspersum* and looked none too clever. It had been planted by my client's great grandfather as a memorial to his dad: my recommendation to fell was immediately dismissed, in favour of a pruning treatment so severe that I was convinced it would prove fatal. However, eleven growing seasons on the tree lacks any appearance of perpetuated – let alone accelerated – decline: is this remarkable reversal of fortune the result of the *Meripilus* infection? Personally, I think so.

Anyway, diverting as this possibility may be, it relates chiefly to an evolved host response to root function resulting from aggressive parasitic infection, and I have other mycological fish to fry at present, so I mention it only in passing.

Photographs 1 and 2 (P1 & P2 respectively) show what I contend are two very different forms of *Meripilus*. The first form, as per P1, occurs as the typical profuse specimen, generally being located ca. 1-3m from the stem base (though not always, as in this case), and commonly found in multiple clusters. In terms of colouration, it quickly ripens from light fawn when fresh to a rich brown, and the frond margins are relatively acute in profile, with the whole tending towards a lax, spreading habit.

***P1 – Typical example of M. giganteus***

The second form, as per P2, typically occurs as a single cluster, tucked well in to a root buttress canyon, or adjacent to the stem. I have only ever seen this form exhibit a paler colouration than the other form, with frond margins being notably rounded in profile, and the fruitbody generally being tighter packed. (For another photograph of this form, see Plate 80 in David Lonsdale's 'Principles of Tree Hazard Assessment and Management'.) It may be a coincidence, but I have never observed this form occurring on a tree in apparent ill health.

***P2 – M. giganteus var. forbesii ?***

P2 shows the fungus adjacent to the stem of a felled tree, and it is notable that there is an almost total lack of decay adjacent to the fructification, though naturally decay could be present elsewhere.

So what are we observing: a variation in morphology and colouration with no wider significance, or two species or varieties with differing characteristics including, crucially, parasitic and saprophytic effects on the infected host? Personally, I incline towards the latter.

The authoritative FWMR Schwarze ('Fungal Strategies of Wood Decay in Trees', Springer 2000) notes that *Meripilus* can occur in a benign 'mode', being saprophytic on the extinct tap root rendered obsolescent by the development of the mature root system. Lonsdale ('Principles of Tree Hazard Assessment and Management', TSO 1999) notes that 'by the time that large fruitbodies... appear, it is likely that a high chance of windthrow exists'.

Approached in light of my theory, these statements are not really contradictory: FWMRS could be documenting the action of a saprophytic species, while Lonsdale is describing the more harmful effects of a parasitic cousin.

There is one more intriguing matter to consider: David Lonsdale relates the unhappy tale of a failed research project into the development and progression of *Meripilus* decay. This was abandoned after the inoculum being used proved insufficiently pathogenic to allow artificial infection of roots by the chosen method for the purposes of studying the result.

This has always baffled me, and no doubt the unlucky mycologist who had to seek elsewhere for her PhD material, because there is no doubt that *Meripilus* can have a devastating effect on an otherwise healthy tree.

However, if this apparent paradox is approached from the perspective of there being two species, or at least two varieties, the problem becomes simplified: the inoculum used for the failed experiment could have derived from the saprophytic type. Indeed, I am tempted to suggest that the impossibility of artificial infection in the noted case *proves* that there are two species/varieties, though naturally I am unaware of any other difficulties that the experiment may have faced.

Finally, to draw variously on the work of FWMRS, Lynne Boddy and Alan Rayner, there is perhaps one more point well worth making: the saprophytic species (which, being a modest fellow, I already think of as *M. giganteus* var. *forbesii*) is presumably endophytic, while the true form has as its colonisation strategy active pathogenesis.

Thus, I suggest that *Meripilus* is akin to *Armillaria*, the full diversity of which has only emerged in recent years, with notably differentiated host-agent relationships and effects being documented.

So where does all this leave the practitioner in the ever present quest for an appropriate management recommendation?

Firstly, we must realise that the equation ***Meripilus* = fell** is no longer valid (if indeed it ever was). For one thing, I have shown that even apparently declining trees can be pruned into a stable and viable remnant, with the beech referred to above still looking pretty good when in leaf. If a *Fagus* can be brought back into management, presumably so can any anything.

Secondly, the occurrence of var. *forbesii* (well, you know what I mean) on an otherwise healthy tree should not in and of itself be a driver for intervention without further investigation of the primary anchor roots.

Thirdly, the occurrence of the true form remains an indicator that possibly destabilising root decay is present, with a determination of the necessity for and means of intervention being driven by the usual considerations for decayed trees.

Clearly this is a matter for further mycological study.

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