

“... *Cryptococcus gattii* infections are extremely rare, usually associated with tropical or semitropical climates and most frequently linked to inhalation of plant spores -- in Australia its mainly from the red river gum, and forest red gum.

The infection, cryptococcosis, affects the lungs first, because it is acquired by inhaling fungal spores.

There were only 96 cases in Australia between 2000 and 2007 and 13 per cent died within four months...” (ref. 1 and 2)

This was one of recent news alerts which attracted my attention. In contrast, my recent *WoW* article on *Wood Fungi and Spalting* recounted how fungi can often produce beautiful, colourful streaking and odoriferous oils and chemicals to form in some heartwoods. But this fungal infection is something rather more insidious and threatening to wood workers, even life-threatening, warranting the attention of all woodworkers in large regions of Australia, parts of North America (ref 3), the Mediterranean region, parts of India and Egypt. A similar report appeared in a newspaper some years ago which alarmed me but these two recent reports prompted this health risk warning.



Volunteer firefighter John Hine contracted a disease from a fungus that grows around eucalyptus trees. (Supplied: Country Fire Authority)

Cryptococcosis is a lung disease caused by the inhalation of fungal spores of two species of *Cryptococcus*: *Cryptococcus neoformans* and *Cryptococcus gattii*. Cryptococcosis effects humans and animals (e.g., Australian koalas). These organisms are usually found in tropical and subtropical climates. They are found in soil and debris associated with trees and cases of cryptococcosis have even appeared in Canada and parts of the US where the source remains uncertain.

“In recent years, it has appeared in British Columbia, Canada and the Pacific Northwest. It has been suggested that global warming may have been a factor in its emergence in British Columbia. From 1999 through to early 2008, 216 people in British Columbia have been infected with C. gattii, and 8 died from complications related to it. In 2007, the fungus appeared for the first time in the USA, Washington and in 2010 had spread to Oregon. The most recently identified strain, designated VGIIc, is particularly virulent, having proved fatal in 19 of 218 known cases ...” (ref 3)

Cryptococcus spp. have a very broad host range. The disease has been reported in a large number of animal species, e.g., horses, cows, cat, dogs, koalas, dolphins, but rarely in reptiles. While cryptococcosis does not occur in birds, *C. neoformans* is frequently found in pigeon or other bird droppings (ref 4).

Although the fungus is found worldwide, in Australia it is mostly found in the sub-tropic and temperate regions. *C. gattii* is particularly prevalent in the Murray Darling river system of south-east Australia. It is where eucalypts such as red gum (*Eucalyptus camaldulensis* and *E. tereticornis*) grows and is often cut for garden borders, firewood, structures, furniture, fence posts, turned for salt and pepper shakers, bowls, and various objects because of its figure and beauty, etc.

Infection with the spores is usually acquired by inhalation of spores found in the environment especially if concentration is high in spore-laden air. The disease is not considered to be contagious.

Fortunately, most people who are exposed to the fungus do not become ill. But if you show symptoms (see below), especially if your immune system is weak, or after cutting firewood or wood with rot (especially the Australian red gum species suggested), see your doctor without delay for diagnosis and treatment.

Symptoms

These are some of the symptoms to watch for (ref 3): sputum production, prolonged cough (lasting weeks or months), sharp chest pain, shortness of breath, sinusitis (cottony drainage, soreness, pressure), severe headache (meningitis, encephalitis, meningoenzephalitis), stiff neck (prolonged and severe), muscle soreness (mild to severe, local or diffuse), photophobia (excessive sensitivity to light).

In the few people who do become ill, these symptoms may appear weeks to months after exposure so the link to a woodwork activity may be forgotten.

Diagnosis using Cryptococcal Antigen (on serum or cerebrospinal fluid) may be a useful preliminary test for cryptococcal infection as it has high sensitivity for the disease. (It could be suggested to the doctor for helping with diagnosis.)

Treatment

In more severe cases of infection, hospitalisation is usually necessary. There, treatment consists of prolonged intravenous antibiotic therapy (for some weeks). The most common antifungal drug used is amphotericin B. Oral or intravenous flucytosine is usually co-administered followed by some months of oral fluconazole.

Often antifungal drugs are insufficient to reverse *C. gattii* infections, and surgery may then be required. So, you can see this is or can develop into a very serious infection.

The type of treatment depends on the severity of the infection and the parts of the body that are affected.

Those patients with *C. gattii* infection are usually prescribed an antifungal medication for six months or more. Those with asymptomatic infections (i.e., show few or no symptoms) or with mild-to-moderate lung infections, the treatment is usually with fluconazole.

A link to a Victorian Health advice is provided (ref 5). Interestingly, *C. neoformans* is more commonly seen in immunocompromised (immunologically weak) people; *gattii* is more commonly seen in immunocompetent (immunologically stronger) people.

So, you can see this is, or can develop into, a very serious infection. If you have any symptoms of suspect that “something is wrong” see your doctor.

Avoidance Measures

No vaccine is available so it can't be prevented by vaccination.

Woodworkers who are immunosuppressed should avoid contact with birds, bird droppings, avoid digging soil and while working with red gum (Victorian / South Australian or “blue gum” in Queensland (*E. camaldulensis* and *E. tereticornis*, respectively) always wear a dust mask, especially cutting wood with hollow or rotted insides (e.g., see ref 6).

References and Further Reading

Sydney father Luke Baglin battles 'killer' gum tree as baby daughter remains in intensive care (2017). <https://thewest.com.au/news/australia/sydney-father-luke-baglin-battles-killer-gumtree-as-baby-daughter-remains-in-intensive-care-ng-b88489500z>

The wood-chopping Farmer with an axe to grind on fungus (2017) <https://www.abc.net.au/news/rural/2017-06-09/wood-chop-warning-for-fungus-from-eucalyptus-causing-disease/8599890>

https://en.wikipedia.org/wiki/Cryptococcus_gattii

[https://wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Mammals/Cryptococcosis%20in%20Koalas%20Mar%202014%20\(1.1\).pdf](https://wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Mammals/Cryptococcosis%20in%20Koalas%20Mar%202014%20(1.1).pdf)

<https://www2.health.vic.gov.au/public-health/infectious-diseases/disease-information-advice/cryptococcus>
Techniques for the detection of pathogenic Cryptococcus species in wood decay substrata and the evaluation of viability in stored samples. (2013) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3974326/>

Environmental distribution of Cryptococcus neoformans and C. gattii around the Mediterranean basin <https://academic.oup.com/femsyr/article/16/4/fow045/2680354>

Cryptococcus gattii (A General Overview), <https://www.sciencedirect.com/topics/medicine-and-dentistry/cryptococcus-gattii>

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A Potential Source of Cryptococcus neoformans in Egyptian Environment (Egypt) (2016), <https://www.hindawi.com/journals/ijmicro/2016/4080725/>

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