



## Good things come to those who wait

*Aspergillus fumigatus* is an important human fungal pathogen that is implicated in life-threatening infections in immunocompromised individuals, and severe asthma and sinusitis. For almost 150 years, it was considered to be entirely asexual, despite genomic features that hinted at a capacity for sexual reproduction. Dyer and colleagues now describe conditions under which *A. fumigatus* does indeed reproduce sexually. This finding opens up the possibility of developing genetic tools for this organism and has important implications for our understanding of the evolution of pathogenicity and fungicide resistance.

Despite numerous experimental attempts, *A. fumigatus* refused to undergo sexual reproduction in laboratory conditions. Tantalizingly, the sequencing of its genome revealed many characteristics of a sexual species, including a mating type locus that was typical of an obligate

out-crossing fungus. In addition, two mating types have been described, as has gene recombination.

Intrigued by these puzzling findings, Dyer and colleagues studied several isolates from an Irish population of *A. fumigatus*. Having confirmed that these isolates were genetically variable and composed of both mating types, the authors set up crosses, using all combinations of opposite mating types and a range of growth media and temperatures, with 12 confirmed *A. fumigatus* isolates. The 6-month wait turned out to be well worth it — in one of these conditions, they discovered fruiting bodies that were characteristic of sex in aspergilli. Resulting ascospores, upon germination, gave rise to characteristic *A. fumigatus* colonies. Examination of segregation of five genetic markers in ascospore progeny from different crosses confirmed that meiotic recombination took place.

A sexual cycle in other fungi, most notably *Candida albicans*, that were previously presumed to be asexual was also associated with conditions of a specific environmental niche, and the authors suggest that this explains why sexual reproduction in *A. fumigatus* had remained elusive for so long. The existence of sexual reproduction helps to explain many aspects of *A. fumigatus* biology as well as the evolution of virulence and pathogenicity, all of which will become more amenable to investigation using the sexual cycle as a classical genetic tool. The results also suggest that other supposedly asexual fungi might be sexual after all.

Magdalena Skipper, Senior Editor, Nature

**ORIGINAL RESEARCH PAPER** O’Gorman, C. M. et al. Discovery of a sexual cycle in the opportunistic fungal pathogen *Aspergillus fumigatus*. *Nature* 30 Nov 2008 (doi:10.1038/nature07528)



The 6-month wait turned out to be well worth it — in one of these conditions, they discovered fruiting bodies that were characteristic of sex in aspergilli.

