# Scientists warn rising temperatures enable dangerous fungal adaptations



Scientists have issued warnings about the increasing threat posed by fungi, suggesting the rise in global temperatures is enabling certain species to mutate and spread, potentially leading to serious health and environmental consequences reminiscent of scenarios depicted in popular culture, such as the TV series The Last of Us.

The Last of Us, a hit television show, centres around a fungal infection that turns humans into aggressive zombies. While the story is fictional, experts highlight that it is grounded in biological realities. Dr Jim Kronstad, a professor and microbiologist at the University of British Columbia, explained, “Fungi love to make spores!” emphasising their prolific capacity to reproduce and spread in conducive environments.

One example of fungi’s capacity to affect living organisms is cordyceps, a parasitic mushroom known for its dramatic manipulation of insect behaviour. Cordyceps invades an ant’s brain, compels it to climb to an elevated branch, and ultimately bursts through the ant’s head to release spores onto the forest floor. This remarkable interaction has inspired themes seen in The Last of Us. Dr Kronstad noted that rising global temperatures are driving fungi like cordyceps to adapt and expand their range, potentially to places such as Britain.

The concern extends beyond insects to human health as well. Candida auris, a fungal pathogen first discovered in a 70-year-old woman in Japan in 2009, has rapidly spread to South Korea, India, and more recently Britain, where the first case emerged in 2016. By 2017, it was described as a “catastrophic threat” by the American Centers for Disease Control due to its resistance to all currently known antifungal drugs. This fungus can infect the bloodstream, central nervous system, and internal organs, posing severe risks especially in healthcare settings.

Prof Kronstad explained the link between climate change and fungal adaptation: “I think there is definitely a concern with climate change, as an important way that we keep fungi in check is because most of them can’t grow at our high body temperatures. Increasing global temperatures offers an opportunity for fungi to adapt, as they have pretty fast generation times and mutations may occur that help them survive at higher temperatures.”

Further illustrating fungal resilience and adaptation, scientists have observed the black fungus Cladosporium sphaerospermum thriving on the walls of the Number 4 reactor at Chernobyl, the site of the 1986 nuclear disaster. This fungus has evolved to feed on radiation levels that would be lethal to most other organisms. Researchers speculate this remarkable ability to harness radiation could have practical applications, such as protecting humans from radiation during prolonged space exploration missions.

The Daily Star is reporting that the observation of fungi adapting to extreme environments and evolving drug resistance highlights an emerging ecological dynamic with wide-ranging implications for public health and environmental science.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://pmc.ncbi.nlm.nih.gov/articles/PMC11034633/> - This article supports the claim that climate change is enabling fungi to adapt and spread, potentially leading to serious health consequences. It highlights Coccidioides and C. auris as examples of fungi whose emergence or spread is linked to climate change.
* <https://www.cdc.gov/fungal/about/climate-change-and-fungal-diseases.html> - This CDC webpage discusses how climate change affects fungal habitats and the emergence of new fungal diseases. It also touches on antifungal resistance and geographic expansions of certain fungal species.
* <https://www.science.org/content/article/climate-change-could-make-fungi-more-dangerous> - This article explores the idea that climate change can make fungi more dangerous by aiding their adaptation to higher temperatures, which can lead to increased resistance to antifungal drugs, as seen in a newly discovered yeast pathogen.
* <https://ehp.niehs.nih.gov/doi/10.1289/EHP14722> - This environmental health perspective discusses the impact of climate change on fungal diseases, including increased exposure risk and the spread of fungal pathogens like C. auris, which is hypothesized to have emerged due to climate change.
* <https://wellcome.org/news/will-climate-change-lead-more-fungal-infections> - This Wellcome article outlines how fungi are adapting to rising temperatures, potentially increasing their threat to human health. It highlights the need for more research on fungal diseases and their connection to climate change.