Giant fungus covering many acres found to have stable mutation rate

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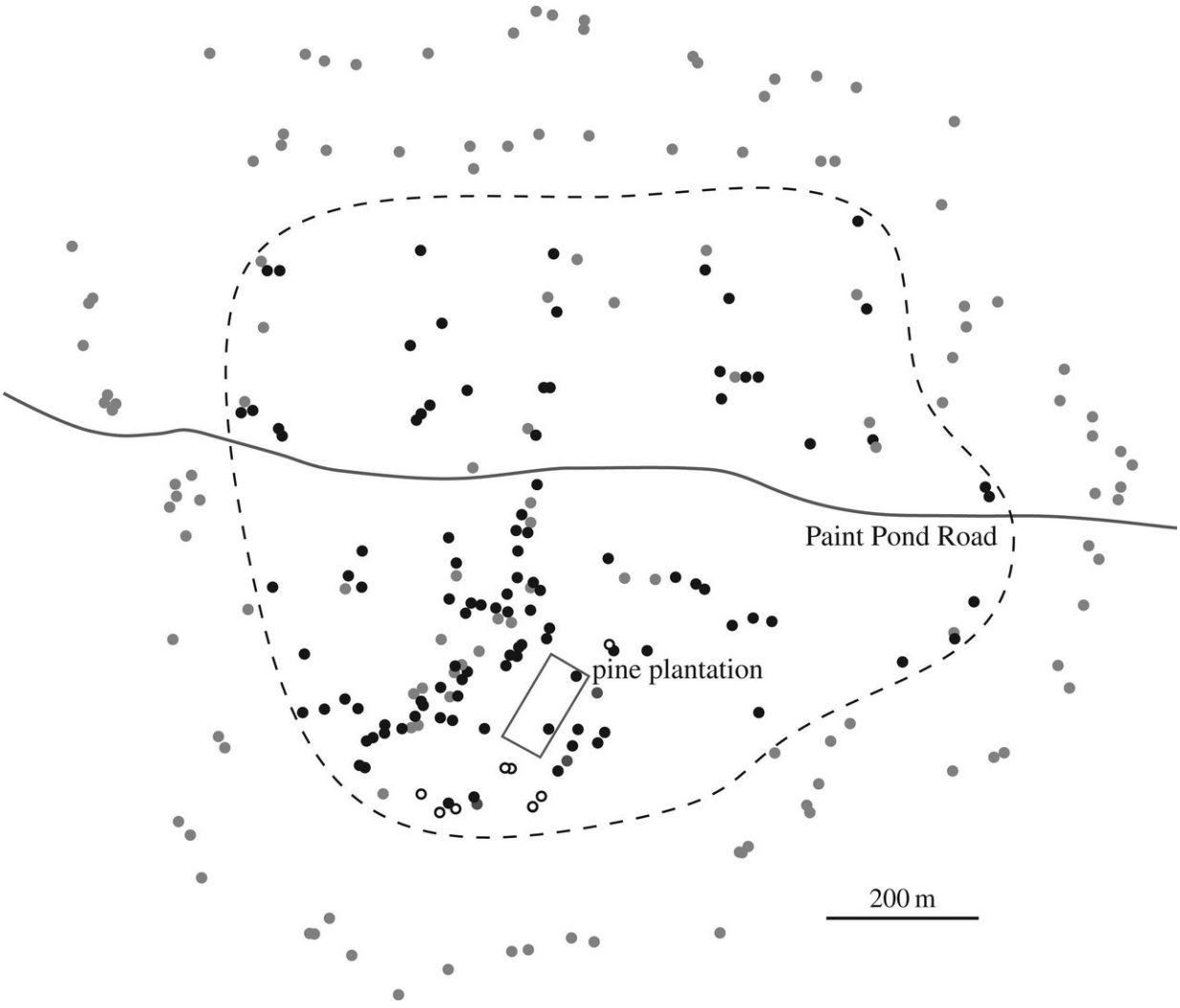

Map of all collections of Armillaria. Black dots, C1; open circles, C2; grey dots, all other individuals combined. The outline of the pine plantation and Paint Pond Road are included as alignment features. The present sample, which was larger

and more broadly distributed than the previous [1], was designed to find the approximate borders of C1. The dashed line encompasses collections of C1 and includes some non-C1 individuals. Other individuals surround C1. The present sample reveals that C1 is larger and older than originally reported [1]. Based on previous growth rate measurements and estimation of fungal biomass, the revised estimates for minimum age and mass are 2500 years and 4 × 105 kg, respectively. Credit: *Proceedings of the Royal Society B: Biological Sciences* (2018). DOI: 10.1098/rspb.2018.2233

A team of researchers from Canada and the U.S. has found that a giant fungus covering many acres has a stable mutation rate. In their paper published in *Proceedings of the Royal Society B*, the group describes their study of the extremely old fungus and what they found.

Back in 1983, Johann Bruhn of the University of Missouri became aware of something preying on weak trees in Michigan's Upper Peninsula near the tiny town of Crystal Falls. He and a team of researchers undertook a study and discovered the culprit was a honey mushroom—a fungus that has been found to grow into very large networks. They concluded that that the mushroom was approximately 1,500 years old and that it covered approximately 15 hectares of forest—most of it out of sight, underground. The only above-ground evidence of the fungus was honey-colored mushrooms that dotted the landscape in the fall. The team also found that the fungus was able to spread using stringy rhizomorphs. In this new effort, Bruhn and his team returned to the site to take another look at the specimen, which has been added to a select group of the largest organisms in the world.

In their new study, the researchers found that the fungus was even bigger and older than first thought. They discovered that it actually spread over 70 hectares and was approximately 2,500 years old. They noted also that adding up its weight showed it to be roughly equal to three blue whales

They were also intrigued by its ability to maintain itself over such a long period. They took some samples and conducted genetic sequencing. They found that the fungus had a very low mutation rate, helping it avoid mutations that might at some point lead to its demise.

The researchers suggest further study of the fungus might reveal how it keeps its mutation rate so low, information that could be helpful to those studying mutation rates on the opposite end of the spectrum—cancerous tumors. They also note that it is possible the fungus is even older than they calculated.

More information: James B. Anderson et al. Clonal evolution and genome stability in a 2500-year-old fungal individual, *Proceedings of the Royal Society B: Biological Sciences* (2018). DOI: 10.1098/rspb.2018.2233