Who are killing loblolly pine trees in the southeastern USA?

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Abstract

A total of 703 fungal cultures were isolated from unhealthy loblolly pine needles. To date, 28 species of fungi representing 17 families have been identified and characterized based on their colony morphology and molecular data. Among them, 13 species of fungi represent either pathogens or weak parasites and 12 species represent saprophytes or endophytes. Brown-spot *Lecanosticta acicola* and needle cast *Lophodermium* spp. were the species most frequently recovered from the diseased pine needles, in addition to tip blight and needle rust pathogens *Diplodia sapinea* and *Coleosporium* sp. respectively. This current emergence of LPND due to several known needle pathogens is expected to be associated with increased pathogen pressure in response to climate change.

Materials & Methods

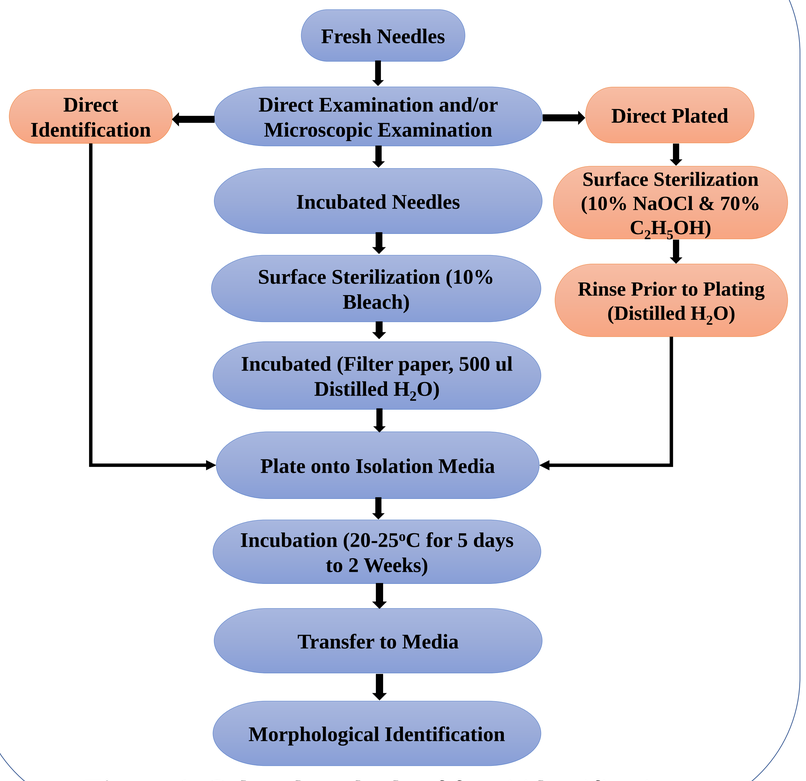

Figure 1. Cultural methods of fungi identification

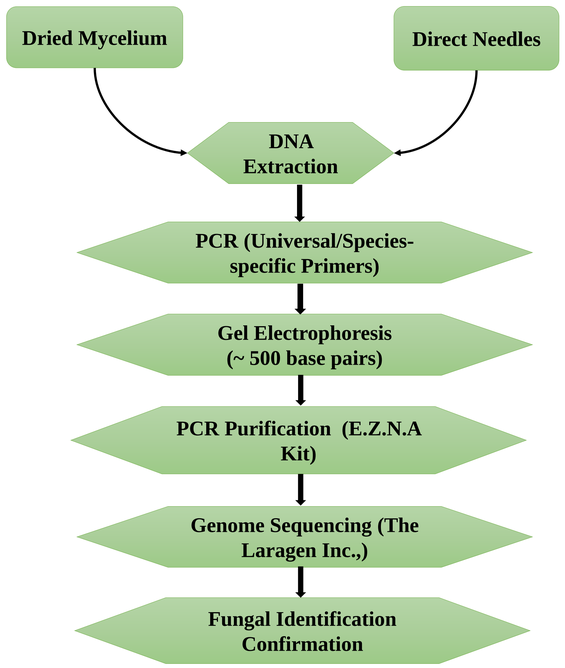

Figure 2. Molecular methods of fungi identification

Results

Morphological characteristics

Figure 3. Disease symptoms & reproductive structures of (a) *L. acicola* (b) *Coleosporium* sp. (c) *Lophodermium spp.* (d) *D. sapinea* on loblolly pine

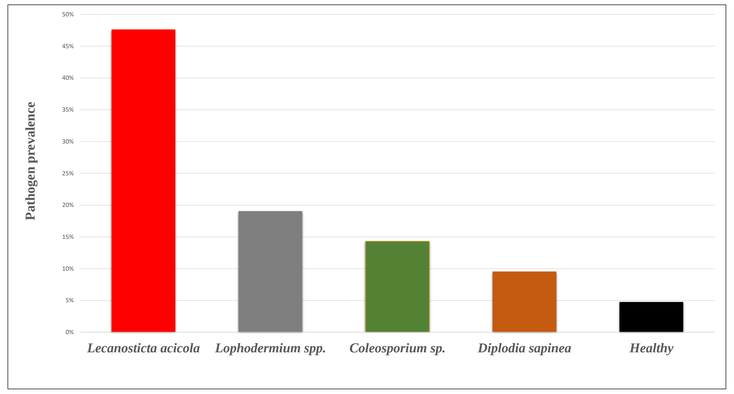

Fig. 7. Pathogen prevalence of *L. acicola*, *Lophodermium* spp., *Coleosporium* sp., *D. sapinae*, and healthy sites

Conclusion

- *Lecanosticta acicola* and *Lophodermium* spp. are the species most frequently recovered from unhealthy loblolly pine needles
- Stands infected by the brown-spot pathogen are mostly situated in the moist areas. Stand prevalence on those sites was ranging from 55% to 99%. Site conditions could be the possible reason explains why stands are experiencing worse conditions on these sites.

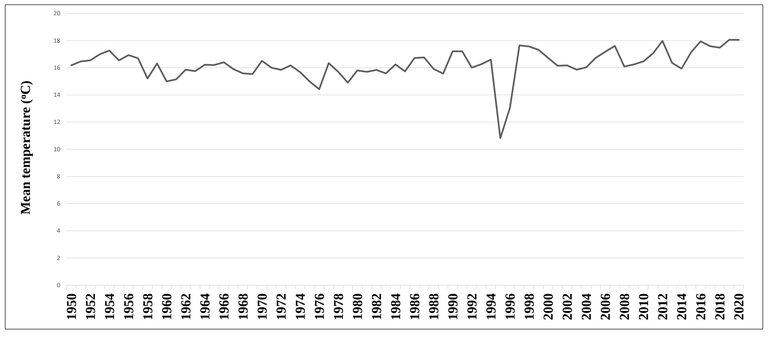

Figure 9: Mean temperature in Alabama, USA

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