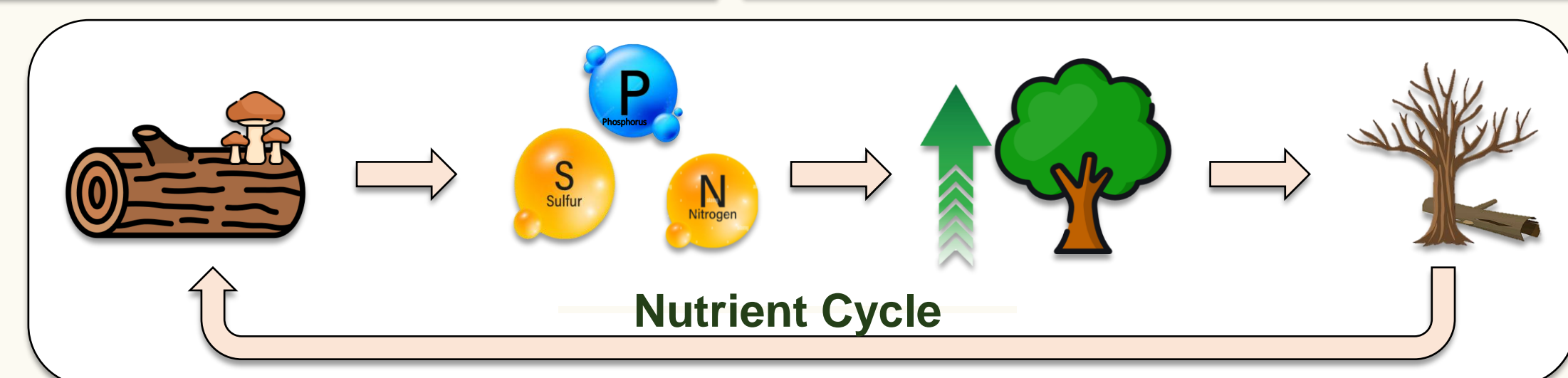


Introduction

- Abruzzo hosts diverse extreme alpine habitats;
- Lignicolous macrofungi (polypores) play key roles in nutrient cycling;
- Extreme environments are natural laboratories to study fungal adaptation in the face of climate changes;
- This study aims to perform a morphological and genetic characterization of polypores collected in Fonte Gelata (fir-wood, 760m) and Monte Sirente (birch-wood, 1500m);



Materials and Methods

Fungal samples were collected during the summer of 2024 across three separate sampling events. Following an initial morphological assessment, mycelia were isolated from small portions of healthy basidiocarps and cultivated under controlled conditions in an incubator. Species identification and phylogenetic classification were carried out through sequencing of the Internal Transcribed Spacer (ITS) regions. Additionally, extracts were prepared from the cultivated mycelia for functional analyses.

Discussion

This study reveals the remarkable diversity of lignicolous polypores in the extreme environments of Abruzzo. Molecular characterization of mycelia confirmed species identification based on fruiting body morphotyping. *Fomes fomentarius* is a common fungus historically used for starting fires. It contains bioactive compounds with potential antioxidant and anti-inflammatory properties. *Trametes hirsuta* and *Trametes ochracea* are lignivorous fungi whose presence is variable depending on environmental conditions. *T. hirsuta* is common in temperate regions, while *T. ochracea* prefers warmer, more humid climates. Since they have also been found in these cold environments, this suggests a potential expansion beyond their typical distribution range. *Phellinus lundellii* has a leathery, resilient fruiting body. It grows slowly on dead trunks and contributes to the natural wood decomposition cycle.

Conclusion

Polypores from these habitats show high biodiversity. Their conservation is crucial not only for forest ecosystems, especially under the pressures of climate change, but also for their potential applications in biotechnology and medicine.

Species identified



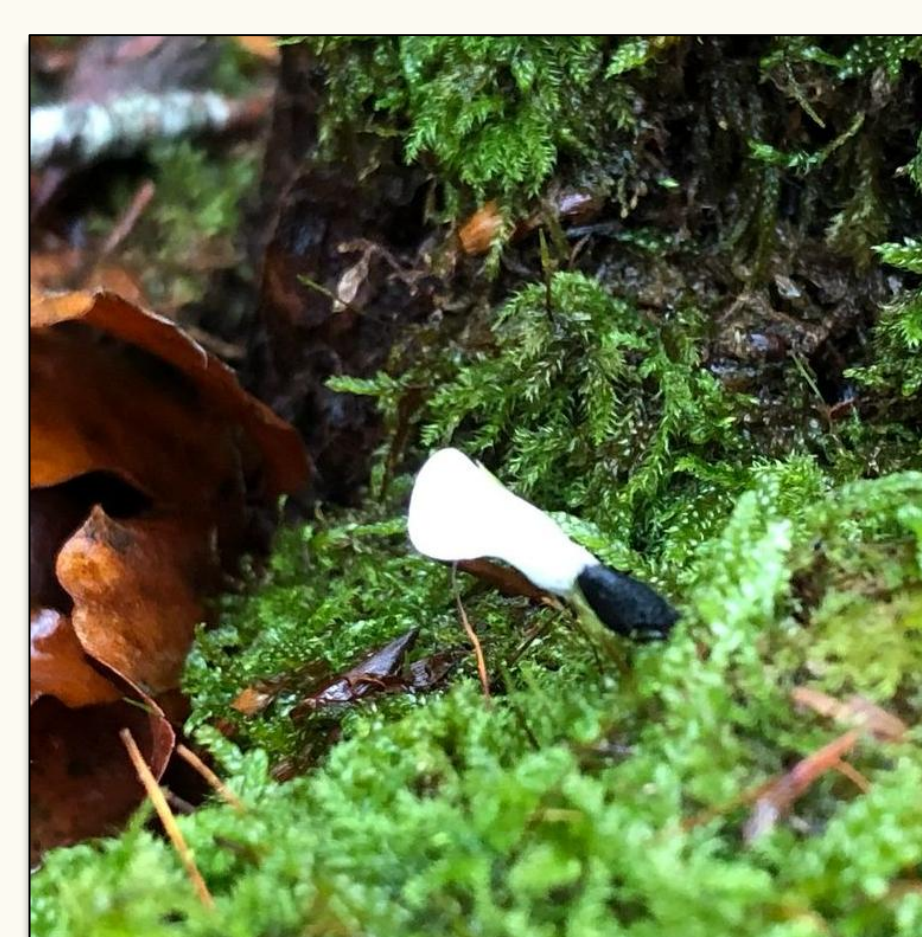
- **Name:** *Trametes hirsuta*
- **Site:** Monte Sirente
- **Characteristics:** A wood-decaying fungus with a hairy, zoned cap, commonly found on dead hardwood.

- **Name:** *Fomes fomentarius*
- **Site:** Fonte Gelata
- **Characteristics:** Called the “tinder fungus,” it has a hard, perennial fruiting body, typically growing on beech.



- **Name:** *Trametes ochracea*
- **Site:** Monte Sirente
- **Characteristics:** Yellowish polypore on wood. Exhibits ligninolytic enzymatic activity.

- **Name:** *Phellinus lundellii*
- **Site:** Monte Sirente
- **Characteristics:** A rare wood-inhabiting fungus with a tough fruiting body. It plays a role in white rot decay of hardwoods.



- **Name:** *Xylaria hypoxylon*
- **Site:** Fonte Gelata
- **Characteristics:** A club-shaped, black ascomycete found on decaying wood. Rich in bioactive secondary metabolites.

Other: *Fomitopsis pinicola*, *Polyporus tuberaster*, *Postia subcaesia*, *Gymnopus aquosus*