

Understanding fungal communities of olive tree leaves for application to climate change adaptation

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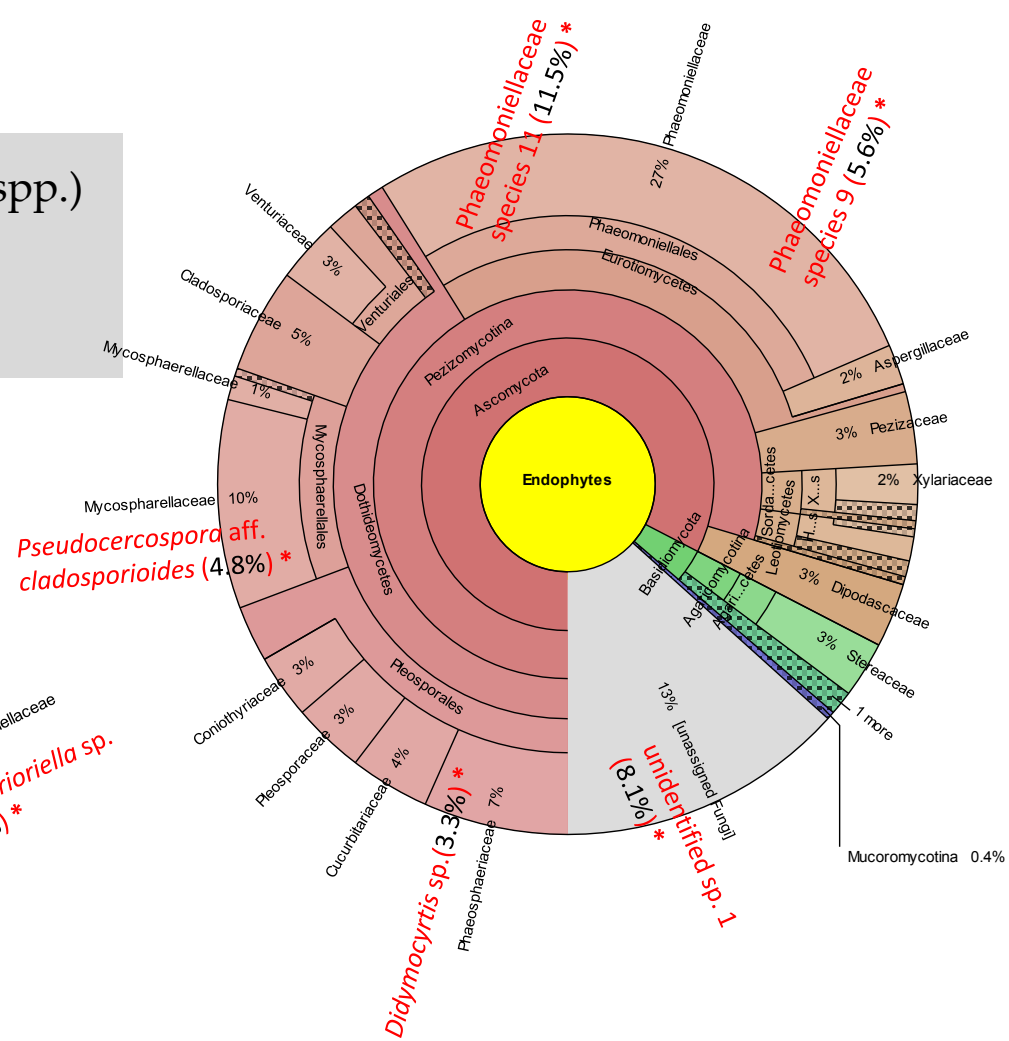
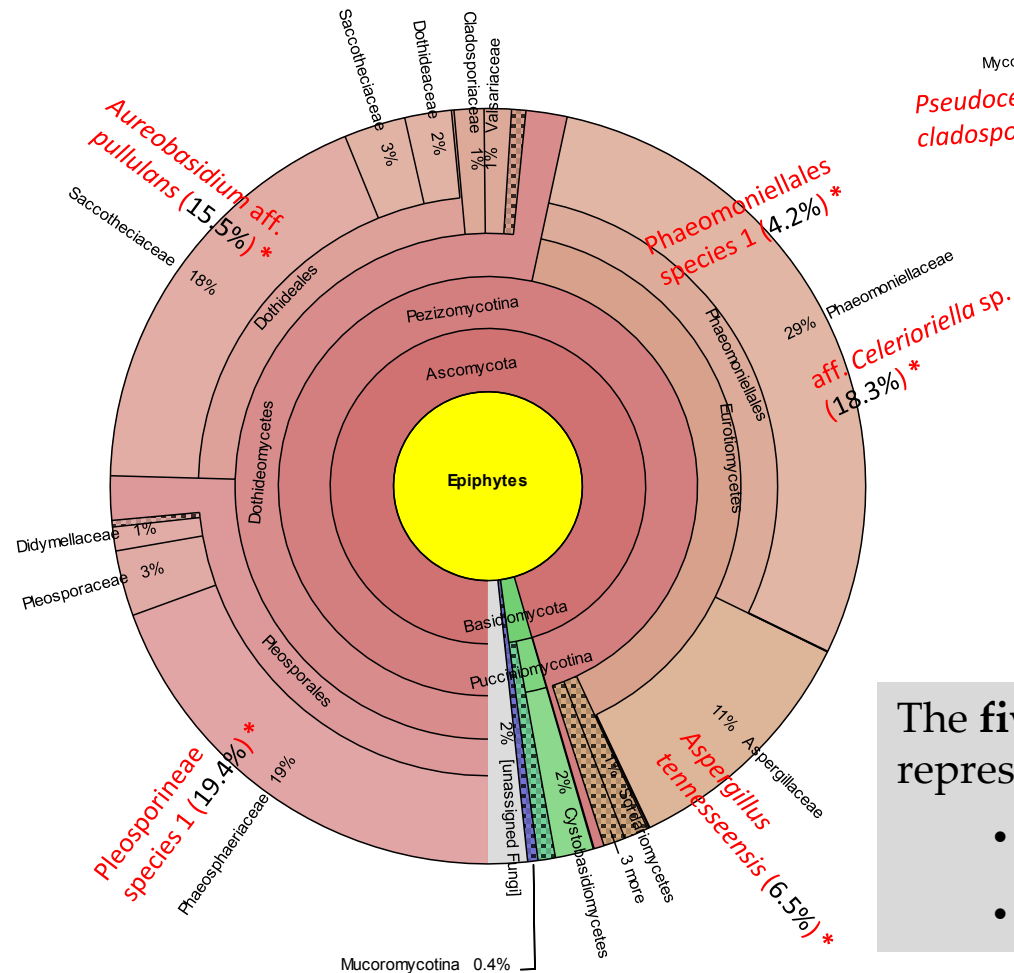
Abstract

The olive tree (*Olea europaea* subsp. *europaea* L.) is a typical plant of the Mediterranean vegetation, well adapted to drought and poor soils being also tolerant to high solar irradiance. The phyllosphere microbiota associated with these plants is likely to play a role in their tolerance to such harsh environmental conditions. Here, we have characterized the endophytic and epiphytic fungal community present in leaves of olive trees, for potential application of these insights to climate change adaptation. Leave samples were collected from a rainfed olive orchard near Mirandela (NE Portugal). Fungi were isolated and counted from the surface and inner tissues of leaves. The isolates obtained were identified by ITS rRNA gene sequencing and their phylogenetic diversity was then analyzed. A *Celerioriella*-like species and two unassigned species belonging to *Phaeomoniellaceae* and *Pleosporineae* were the most abundant taxa within 23 species (out of 161) found in both epiphytic and endophytic subsamples. These strains are good candidates to be studied for their resilience to climate changes in order to be applied as "tolerance inducers" in olive crops from this Mediterranean area.

Keywords: Fungal diversity; endophytes; epiphytes; Internal transcribed spacer; phylogeny

Results and Discussion

- Higher species richness in epiphytes (99 spp.)
- Higher species evenness in endophytes
- Several endophytes fungi unassigned



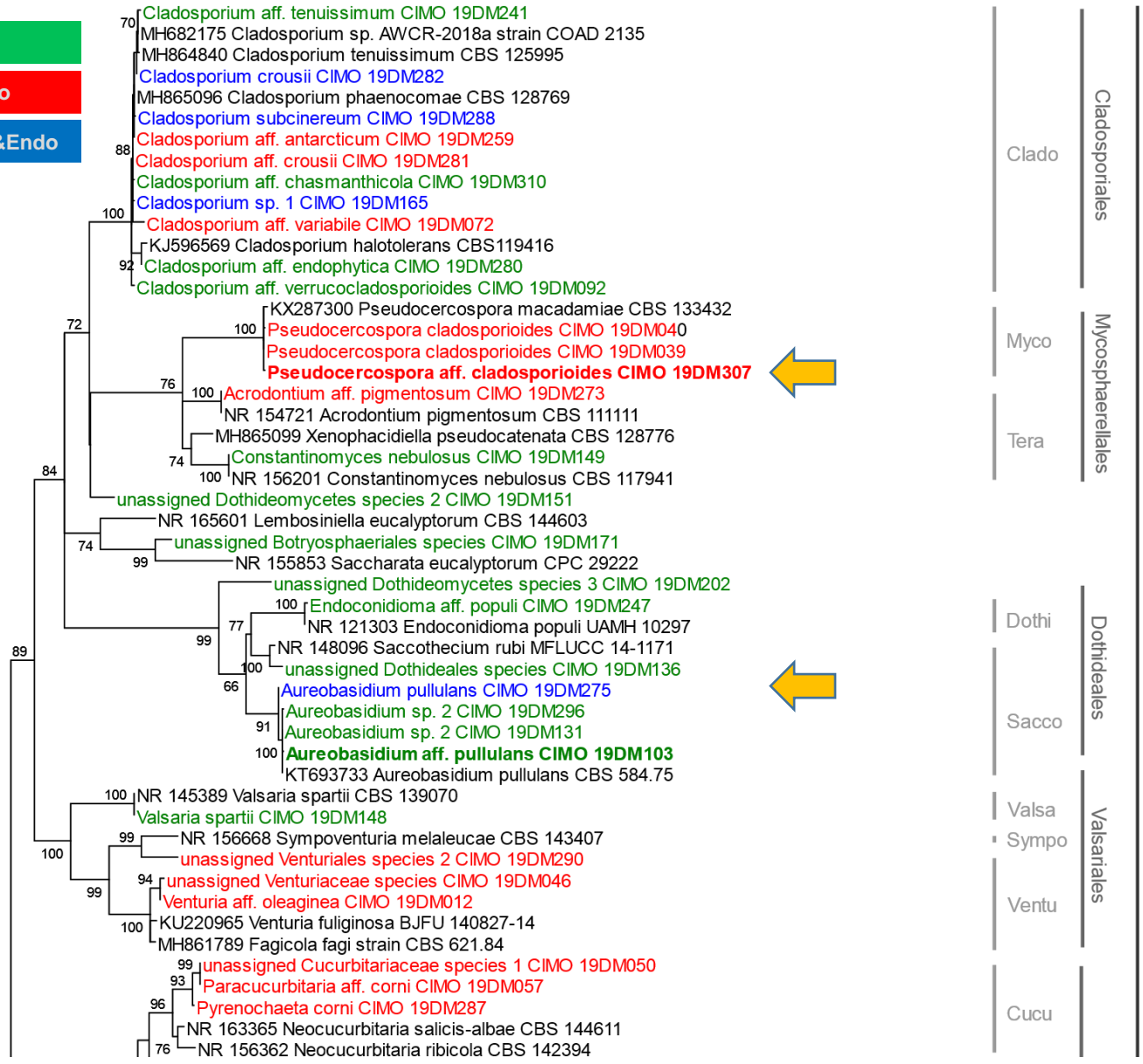
The five **most abundant** taxa * represented:

- 63,9% of epiphytes
- 33,3% of endophytes



Results and Discussion: phylogeny of Dothideomycetes

Epi
Endo
Epi&Endo



Most abundants

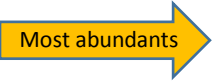


Results and Discussion: phylogeny of Dothideomycetes (cont.)

Epi

Endo

Epi&Endo



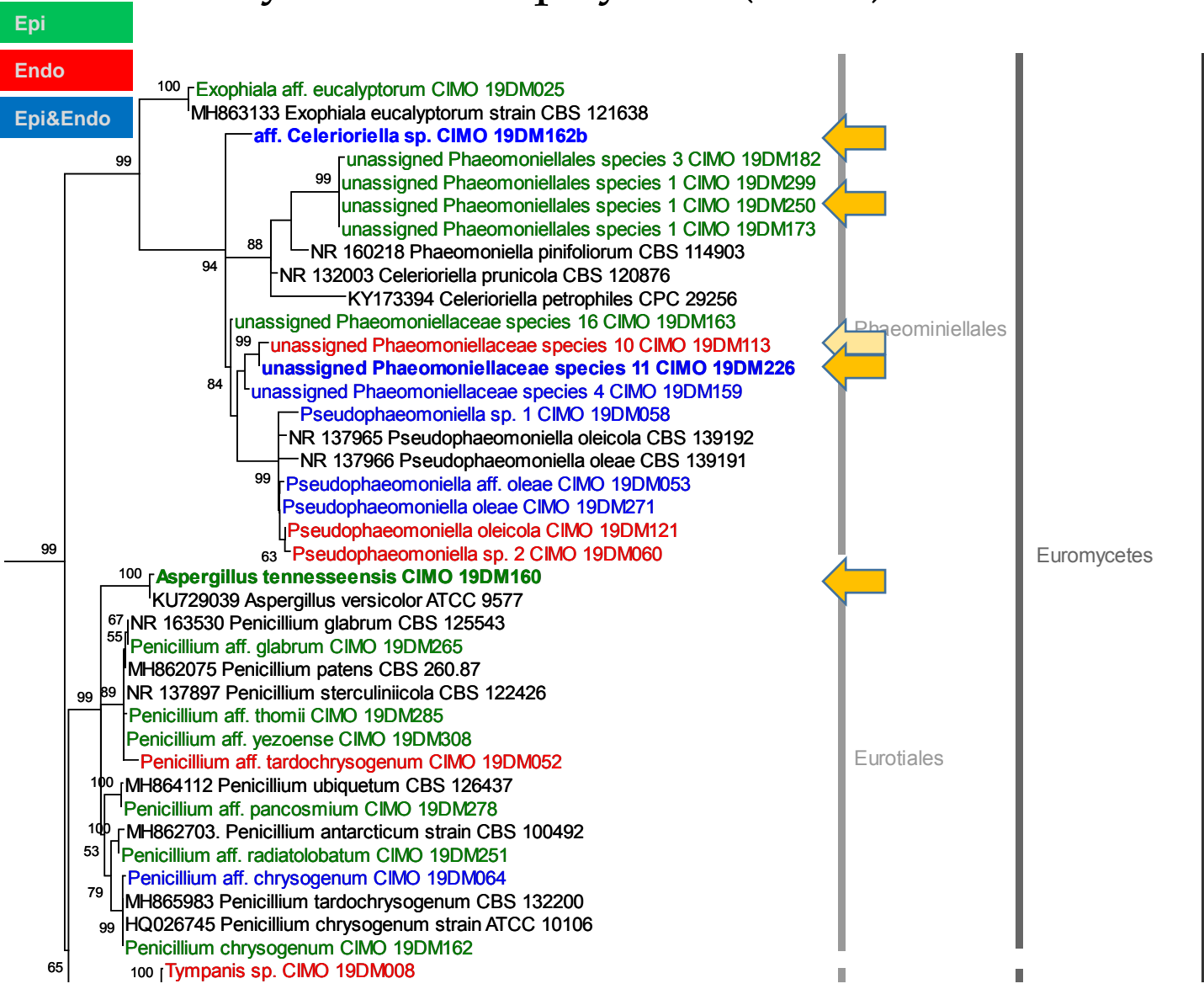
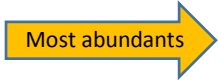
Pleosporales



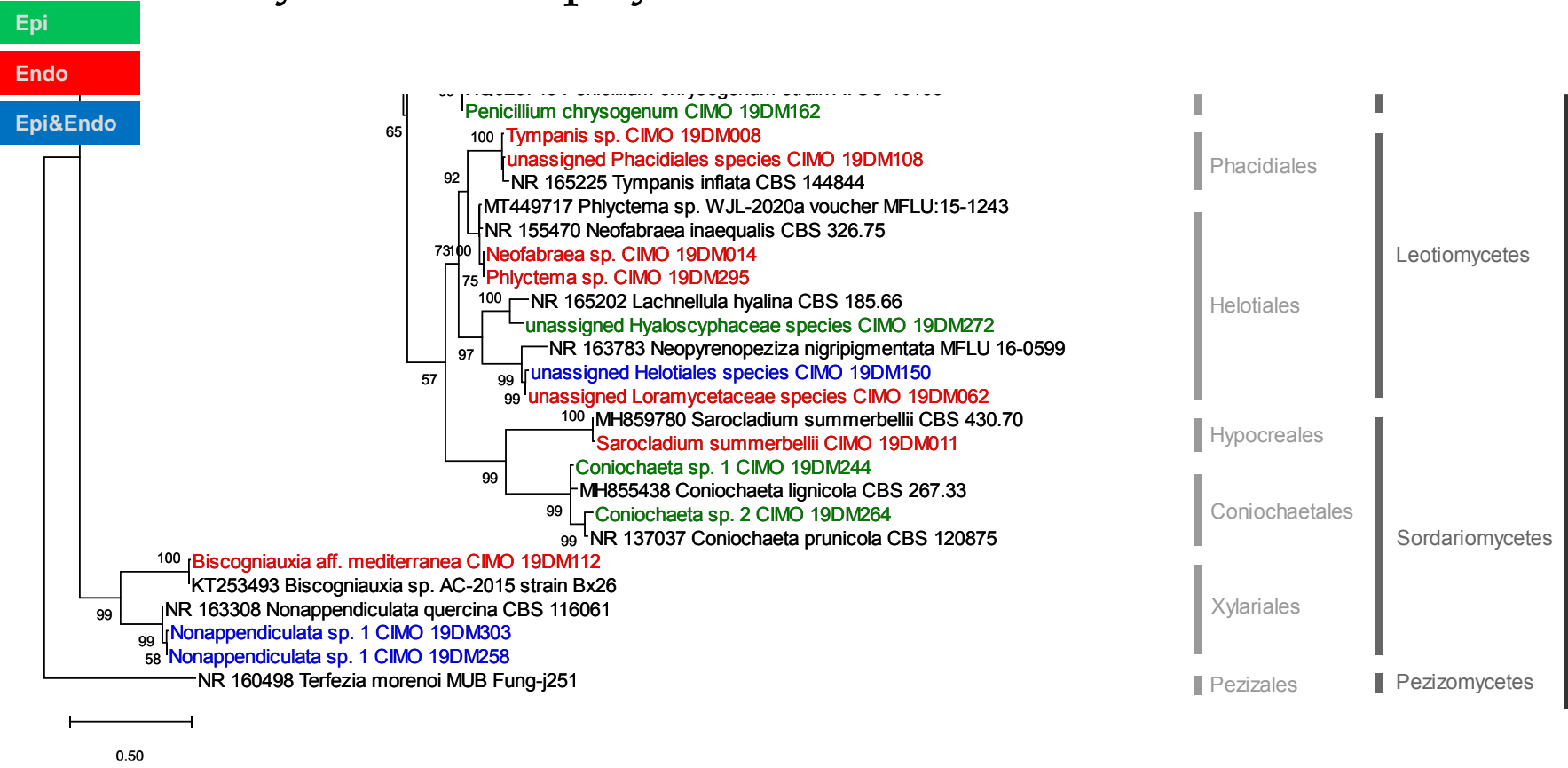
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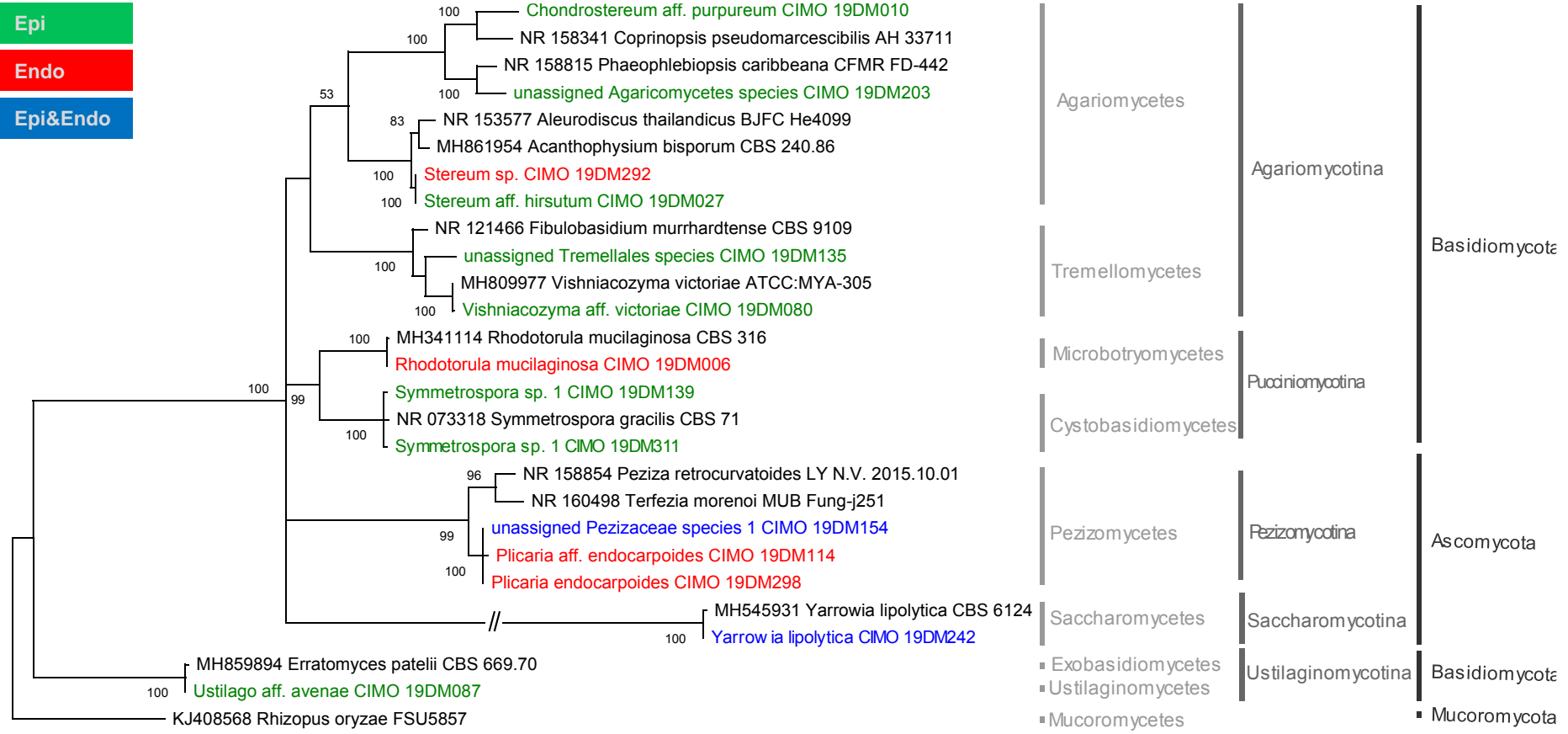
Results and Discussion: phylogeny of remaining taxa from the Pezizomycotina subphylum (cont.)



Results and Discussion: phylogeny of remaining taxa from the Pezizomycotina subphylum



Results and Discussion: phylogeny of Basidiomycota and of remaining Ascomycota taxa



0.50



Conclusions

Twenty-three fungal species (out of 161) found to live both **epiphytically** and **endophytically**, w/ some being abundant

Phaeomoniellaceae → abundant, but understudied on olive trees; several unassigned species (novel taxa)

May species from this group play as **climate change bioindicators** and/or "**tolerance inducers**" in olive crops?

Further research is needed

Acknowledgments

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