

Foliar fungal communities of native and exotic *Fraxinus* taxa from Turkey and testing the monitoring manual for diseases in an Arboretum

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Summary

The genus *Fraxinus* comprises 43 species that occur in the temperate zones of the northern hemisphere. Only three species, *F. excelsior*, *F. angustifolia* and *F. ornus*, are native in Europe and at present under threat by the invasive fungal pathogen *Hymenoscyphus fraxineus*. The pathogen is likely to affect also fungi associated with ash. As the microbiota of plants interact with their host to influence their physiology, contribute to health, growth or fitness, or driving the evolution of multi-disease resistances, assessments of the fungal species diversity can improve our understanding on microbiota-pathogen-host interactions. Even though fungi associated with leaves, shoots, bark, roots or seeds of declining ash trees infected with *H. fraxineus* has been relatively well documented using culture-based techniques and next generation sequencing, no published studies have explored the fungal communities of European ash species in their native range in the absence of *H. fraxineus*. Because *H. fraxineus* has not been reported in Turkey, this creates a unique situation (compared to the rest of Europe) for examining the fungal communities associated with *Fraxinus* in an undisturbed environment. Ash leaves from two native hosts (*F. ornus* and *F. angustifolia*) were collected from four sites during three seasons; in autumn 2015 and in spring and summer 2016. Isolations were performed using traditional culturing and molecular identification of isolates via Sanger sequencing. In addition, the fungal community associated with leaves and rachises were characterized using next generation sequencing. This work gives a fungal community profile for Turkish *Fraxinus* species prior to anticipated pathogen and pest epidemics, giving a baseline reference for assessment of possible species declines associated with new biological invasions. The work also contributed to a study of the global diversity of endophytes associated to *Fraxinus* species in decline currently due to ash dieback and emerald ash borer. Moreover, this STSM work provided new information regarding modern molecular techniques for characterizing fungal populations in that can contribute to protocols for early warning systems against harmful fungi in arboreta or sentinel plantings.