


Destruction of *Fraxinus angustifolia* and *Fraxinus ornus* seeds under storage conditions caused by *Epicoccum nigrum*

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Abstract

During the period of seed storage in 2019, stored *Fraxinus angustifolia* and *F. ornus* seeds showed signs of infection and fungus *Epicoccum nigrum* was isolated from mould and necrotic lesions on the seeds. In order to confirm the pathogenicity of *E. nigrum* towards *F. angustifolia* and *F. ornus* seeds, an experiment that included inoculation of seeds with *E. nigrum* and the assessment of germinability was performed. The inoculation with *E. nigrum* strain caused mould to around 20% of *F. angustifolia* and 58% of *F. ornus*, necrotic lesions to 96% of *F. angustifolia* and 92% of *F. ornus*, and decrease in germinability to 95% of *F. angustifolia* and 97% of *F. ornus* seeds. This study presented, for the first time, the ability of *E. nigrum* to cause high infection rates and reduced germinability of the *F. angustifolia* and *F. ornus* stored seeds. The transmission routes and possibilities for preventive strategies were discussed.

KEYWORDS

germinability, manna ash, narrow-leaved ash, seed pathogen

1 | INTRODUCTION

The collection of ash (*Fraxinus* spp.) seeds includes intensive field work in order to achieve species' genetic diversity (FRAXIGEN, 2005). Effective seed storage is very important for forest practitioners to maintain seed viability, which could be impacted due to inadequately performed standard practices during collection (De Vitis et al., 2020). During the storage period in 2019, mould and necrotic lesions were recorded on the *F. angustifolia* and *F. ornus* seed surfaces, stored in Bukovica (Montenegro). The infection symptoms were recorded for two scenarios: (i) when the seed was stored using the moist cold stratification technique, and (ii) when it was stored without stratification. The objectives of this research were as follows: (a) to determine the fungus causing infection symptoms on *F. angustifolia* and *F. ornus* seeds during storage, and (b) to investigate the pathogenicity of identified fungus towards *F. angustifolia* and *F. ornus* seeds through the evaluation of infection symptoms and germinability.

2 | MATERIALS AND METHODS

2.1 | Study area

Fraxinus angustifolia and *F. ornus* seeds with visible fungal infections were sampled in a separate storage facility, as there is an intention for the creation of seed stocks to ensure sustainability in forest management as well as seedlings production for scientific researches in the locality Bukovica (Montenegro) in November and December 2019 (43°01'15" N, 19°08'32" E). The *F. angustifolia* seed was collected in the provenance Glava Zete (42°39'20" N, 19°00'29" E) and *F. ornus* seeds in the provenance Slatina (42°35'04" N, 19°08'48" E). All seeds were stored in a chamber with a temperature of 10°C and 45% humidity. The stored seeds were divided into two groups: in the first group, the moist cold stratification technique was performed using 20×20 cm wet filter paper soaked in distilled, sterilized water, and in the second group the stratification has not been performed and the seeds were kept in 15×10 cm ordinary paper bags.