Modelling seed germination of five species of Eucalyptus to facilitate optimal reforestation

**Context**

Although the current extent of forests continues to decline, at the same time sustainable forest management has never ceased to attract so much interest. Among the species most used in reforestation, hardwoods of the genus Eucalyptus; tree with a trunk diameter of more than 1 meter and a height up to 35 m. Such as *E.astringens, camaldulensis, and saligna*, which are the most planted and known for their melliferous character and their resin production, *E.microtheca* whose leaf extracts are used as antiseptic, disinfectant, and *E.ovata* used for parrot food.

**Objective**

Eucalyptus is an enormous and fascinating genus with over 700 species. Most of Eucalyptus species are known as aromatic plants and with medicinal and melliferous uses. Therefore, it's important to valorize and ensure a continuous regeneration of Eucalyptus species. In this prospect, the main focus of this work was to evaluate seeds viability used to regenerate forests and in order to elevate its production of NWFP.
Results
In this work, we evaluated the viability of the seeds collected by the forestry department in order to be used for future reforestation stored at a temperature of 4 °C and a relative humidity of 80%. The Eucalyptus are called opportunists whose growth depends essentially on the optimal average temperature but before sowing need to be sprayed with insecticide and fungicide products. The results obtained show that:
- Germination percentage of Eucalyptus seeds varies from 60% for *E. microtheca* to 80% for *E. ovata* and *E. camaldulensis*.
- *E. astringens* and *E. microtheca* showed a delay in germination compared to the other species that could be explained by a harder seed coat and a much higher water need.

Recommendations
Forests play a fundamental role in the fight against rural poverty, ensuring food security and providing decent livelihoods. The reforestation proceeding must consider seed nature, conservation conditions and water need. In fact, thanks to their genetic heritage and their evolution over the millennia, Eucalyptus, have acquired growth characteristics which are essential for reforestation. They have vigorous and aggressive characters that allow them to enable the rapid creation of forest resources.

Impacts and weaknesses
Seeds conservation conditions are important factor to maximize seeds germination. In Tunisia, the cultivation of PAMs such as eucalyptus is seen as a means of diversifying agricultural and an activity of interest to disadvantaged regions. There is an increase in the use of natural MAP products and their derivatives. But, at the same time there is a strong human influence, a deterioration and loss of natural habitats in addition to inappropriate methods of harvesting, as well as an irregularity of production and this under the effect of climatic hazards and conflicts interests.

Future developments
The results show that these species have a high and rapid germination kinetics that could help fast regeneration of the forest. A wise choice is to be done considering the location of the sowing in order to optimize the germination results. This can contribute to the cultivation of high value-added MAPs, thus helping to revitalize the agricultural activity and create additional sources of income for farming families in the area while encouraging the installation of workshops for harvesting and processing PAM and the promotion of local natural and cultivated products.
Further information

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About INCREDIBLE Project

INCREDIBLE project aims to show how Non-Wood Forest Products (NWFP) can play an important role in supporting sustainable forest management and rural development, by creating networks to share and exchange knowledge and expertise. ‘Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin’ (INCREDIBLE) promotes cross-sectoral collaboration and innovation to highlight the value and potential of NWFPs in the region.

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