

Characterization of viable and endophytic South African derived fungal categories as a prevention strategy against the future European import of new potential biological hazards within the Portuguese cut-flowers cultivation of Proteaceae ornamental varieties

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Summary

South Africa, with over 350 species, is one of the World greatest genetic resources of Proteaceae. Germplasm is used to develop cut-flowers varieties of Proteas in many temperate regions of the globe. Cultivation occurs in open fields with a production life of 20 years. The main trades are from South Africa, Australia and New Zealand to Europe, USA and Japan. The Portuguese cut-flowers industry is the largest of the European countries. Local producers imported propagation material during the late 1990s from South Africa. This situation may have caused the migration of many unknown pathogens from South Africa to Europe during the period when Protea farming was established in Portugal.

The knowledge of Proteaceae pathogens is quite scarce. Farmers resort to laboratory analysis only when strong outbreaks occur in their plantations and no systematic monitoring is carried out. Cuttings can't be sold if damages due to disease is present and because of this crown pathogens are more studied compared to problems related to soil microorganisms.

Based on a large amount of data about the distribution of *Phytophthora* and *Botryosphaeria* collected across the cultivation and natural ranges of South African Proteaceae, concluded during the last year, a project aimed to assess the risk of arrival of new fungal pathogens to Portugal has been created. Using analogous methodology used in South Africa, Portuguese samples of roots, soil and asymptomatic twigs of ornamental varieties of Proteas and local endemic vegetation have been collected and processed with selective isolation techniques and NGS technologies.

Aims of the research are multiple. First we want to provide the description of twigs endophytic community and root-soil target pathogens of Proteas in Portugal. Additionally we will compare the results of South Africa and Portugal in order to list which dangerous microorganisms are in common and which, exclusive to South Africa, might represent possible hazards for Portuguese production. Trials were also carried out next to Portuguese farms in order to see if diseases of Proteas escaped and attacked native plants. This aspect is of primary importance for the Objectives of the Action: plant species of Portuguese bush might be the first hosts of pathogens imported from South Africa due to the proximity source of inoculum and these plant can be considered sentinel plants for the local vegetation.