CORK OAK DISEASES AT DOÑANA NATIONAL PARK (SW SPAIN)

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Since early 90’s, a severe decline of aged cork oak populations has been observed in the area called “La Vera” at Doñana National Park in southern Spain. At the current rate of mortality, cork oaks are predicted to be extincted in just a few decades. Oak decline seems to include various factors. One of the most evident causes of the decline is the pressure of a big colony of tree-nesting wading birds, as long as the large amounts of bird dejections could modify soil properties and the ecology of their myco flora. On the other hand, it was confirmed that many of the oaks showing crown sintoms (mainly defoliation) are infected by at least one aggressive soilborne pathogen causing root rot. Probably, the modification of soil composition due to nesting birds has worsening the effect of fungal pathogens in their interaction with oak root systems.

Moreover, branches are also affected by cortical pathogens which promote the death of parts of the crown. Nesting birds also could enhance the incidence of the bark disease, causing wounds on branches that favour fungal infections.

The objective of this work was the diagnosis of the main diseases present in the zone, clarifying their ethiology, incidence and severity. Among the main diseases associated with oak decline, highlights the root rot caused by the soilborne oomycetes \textit{Pythium spiculum} and \textit{Phytophthora cinnamomi}. The main branch disease detected was the cortical canker caused by \textit{Botryosphaeria corticola}. All these pathogens are commonly found in different oak ecosystems in southern Spain and Portugal, causing death of thousands of trees every year.

Air view of Doñana National Park (south-western Spain)

Cork oak decline due to bird nesting
Cork oak defoliation due to root infection by *Pythium spiculum*.

*Py. spiculum* Sporangia
Cork oak diseases at Doñana National Park (Spain)

Since early 90's, a severe decline of cork oak populations has been observed in the area called "La Vera" at Doñana National Park in southern Spain. Oak decline include various factors. One of the most evident causes of decline is the high amount of bird nesting populations, since their dejections modify the soil characteristics and the ecology of its mycoflora.

Many oaks showing crown symptoms (defoliation, wilting and death) are infected by at least one aggressive soilborne pathogen causing root rot: *Pythium spiculum* or *Phytophthora cinnamomi*.

Branches are also affected by cortical pathogens which promote the death of parts of the crown. The main branch disease detected was the bark canker caused by *Botryosphaeria corticola*. Nesting birds also could enhance the incidence of the disease, causing wounds on branches that favour fungal infections.