Exposure to fungi in cork: Potential occupational hazard

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Introduction
Cork is a light, porous, impermeable material extracted from the bark of some trees. The most widely used cork is obtained from the cork tree (Quercus suber). It is estimated that the area occupied by cork oaks in the Iberian Peninsula is around 33% in Portugal and 23% in Spain [1]. Portugal is the largest cork producing country in the world, followed by Spain, and its industry is an important economical resource [2]. The processes used in the manufacture of cork depend on the end product to be obtained, being the production of stoppers for wine bottles the main application. Most of the cork is stored under dark humid and moldy conditions. During the manufacturing process, workers are exposed to an environment that is heavily contaminated with cork dust [3]. Due to this repeated exposure to moldy cork dust, cork workers are at risk for developing occupational lung diseases such as occupational asthma and Suberosis.

Aim
Given the importance of this occupational setting in Portugal, the aim of this review study is to assessing occupational exposure to fungi in cork industry and potential health effects.

Prevalent Species
In the analyzed scientific papers it was possible to verify that there are two fungal species frequently cited as the most prevalent in the cork and associated with Suberosis and Occupational Asthma.

<table>
<thead>
<tr>
<th>Other studies</th>
<th>Fungi species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillium glabrum (Penicillium Imperfectum)</td>
<td>athlete alveolar ( \text{P. glabrum} )</td>
</tr>
<tr>
<td>Cryosporia stigmata</td>
<td>athlete alveolar ( \text{C. stigmata} )</td>
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<tr>
<td>Thricoderma longibrachiatum</td>
<td>athlete alveolar ( \text{T. longibrachiatum} )</td>
</tr>
<tr>
<td>Other species</td>
<td>athlete alveolar</td>
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</tbody>
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Table 1: The most referred species on moldy cork dust.

Conclusion
A specific knowledge about occupational exposure to fungi in the cork industry is the key to better understand the related diseases and to define preventive measures. According to some studies there are preventive measures that can be adopted in order to reduce workers’ fungal exposure during the labor period, emphasizing the workplace frequent cleaning and located ventilation in certain tasks [8]. Considering that there are few studies on this matter, and the importance of this occupational setting in Portugal, is essential to realize more studies and subsequent regulation of fungal exposure in this field. Taking into account that fungal exposure is associated with inhalation of aerosolized particles will be relevant in future studies evaluate the combined exposure of fungi, particles, and also their metabolites.

References