



Fungal Diversity and Community Composition of Culturable Fungi in *Stanhopea tigrina* Cast Gibberellin Producers

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Stanhopea tigrina is a Mexican endemic orchid reported as a threatened species. The naturally occurring microorganisms present in *S. tigrina* are unknown. In this work, we analyzed the diversity of endophytic and epiphytic culturable fungi in *S. tigrina* according to morphological and molecular identification. Using this combined approach, in this study we retrieved a total of 634 fungal isolates that presented filamentous growth, which were grouped in 134 morphotypes that were associated to 63 genera, showing that *S. tigrina* harbors a rich diversity of both endophytic and epiphytic fungi. Among these, the majority of the isolates corresponded to Ascomycetes, with *Trichoderma* and *Penicillium* as the most frequent genera followed by *Fusarium* and *Aspergillus*. Non-ascomycetes isolated were associated only to the genus *Mucor* (Mucoromycota) and *Schizophyllum* (Basidiomycota). Identified genera showed a differential distribution considering their epiphytic or endophytic origin, the tissue from which they were isolated, and the ability of the orchid to grow on different substrates. To our knowledge, this work constitutes the first study of the mycobiome of *S. tigrina*. Interestingly, 21 fungal isolates showed the ability to produce gibberellins. Almost half of the isolates were related to the gibberellin-producer genus *Penicillium* based on morphological and molecular identification. However, the rest of the isolates were related to the following genera, which have not been reported as gibberellin producers so far: *Bionectria*, *Macrophoma*, *Nectria*, *Neopestalotiopsis*, *Talaromyces*, *Trichoderma*, and *Diplodia*. Taken together, we found that *S. tigrina* possess a significant fungal diversity that could be a rich source of fungal metabolites with the potential to develop biotechnological approaches oriented to revert the threatened state of this orchid in the near future.

Keywords: fungal diversity, orchid, *Stanhopea tigrina*, endemic, endophytes, epiphytes, gibberellins

INTRODUCTION

Fungi play a central role in most ecosystems and they have important functions in soil and plant habitats. It is now clear that the microbiota associated with plants contribute to maintain their biological diversity in terrestrial ecosystems through different biological processes (Côté and Rumpff, 2014; Hardison et al., 2015). In this regard, the fungal population associated with plants

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