

TITLE: BROAD OCCURRENCE OF *Zygopetalum mackayi* IS RELATED TO A LOW MYCORRHIZAL SPECIFICITY

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ABSTRACT:

Orchids rely on a fungal partner to germinate their own seeds and for the growth and development in natural condition. While some orchids associate with a small number of mycorrhizal fungi, other can associate with many. Orchids species associated with wide or narrowly distributed fungus may have a broader or limited geographic occurrence, respectively. Thus, the geographic distribution of an orchid may rely on fungi distribution. *Zygopetalum mackayi* Hook. is a terrestrial widespread species occurring in Brazilian Atlantic Forest, one of the most important hotspots, and no previous work have shown which fungi are associated with this orchid species. Therefore, the aim of this study was to investigate if the broad occurrence of *Z. mackayi* is due to association with one widespread fungus or with many fungi species. We harvested root samples from four localities: two in Rio de Janeiro state, Paty do Alferes and Nova Friburgo, and two in Minas Gerais state, Rio Preto and Araponga. The total DNA was extracted and the ITS1 fungal region sequenced by Illumina MiSeq®. Ascomycetes were the predominant phylum ($\approx 69\%$), being the main endophytes genera with unknown function. Basidiomycetes, Zygomycetes and unidentified phyla were represented by 19, 20 and 4% of reads, respectively. We found that *Z. mackayi* associate with two well-known mycorrhizal fungi families: Sebacinaceae and Ceratobasidiaceae. While in Rio de Janeiro the association is exclusively with fungi species from Sebacinaceae family, in Minas Gerais is uniquely with Ceratobasidiaceae. We also found that in high altitudes (Araponga - 1492 m) the fungi diversity were lower ($p < 0.05$) than in low altitudes (Paty de Alferes - 1123 m, Rio Preto - 1125 m and Nova Friburgo - 1329 m), corroborating with recent literature. This work shows that broad occurrence of *Z. mackayi* is probably due to its ability to associate with many mycorrhizal fungi species.

KEYWORDS: orchid mycorrhiza, Atlantic Forest, orchidaceae, amplicon sequencing, Illumina.

DEVELOPMENT AGENCY: FAPEMIG, CAPES, CNPq