

**Sequence Identification and Metabolic Analysis of Endophytes in Shining Clubmoss
(*Huperzia lucidula*)**

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The objective of this research project is to extract, analyze, and sequence the endophytic fungi found in the Shining Clubmoss (*Huperzia lucidula*). Endophytes are fungi or bacteria that are found living symbiotically within or near the healthy plant tissue. Almost 300 endophytes have been isolated from the shining clubmoss, with around 20 highlighted to be of special interest through a metabolite analysis. Fungi can produce secondary metabolites of special interest to medicinal research, such as Huperzine A. This secondary metabolite inhibits Acetylcholinesterase (AChE), which has been found to be effective in treating Alzheimer's disease. We tested several strains through HPLC analysis and an enzyme inhibition assay. This proved there is a presence of Huperzine A at varying amounts. Only the highest producing endophytes were processed for identification through DNA sequencing. The process began with a DNA extraction of the tough fungal cells and a polymerase chain reaction (PCR) to amplify the target DNA sequences with ITS primers. The sequence was then cloned into plasmids and sent off to a third-party company for DNA sequencing. The results elicited that we isolated endophytes both from the *Ascomycota* and *Zygomycota* phyla. Results from this study can be utilized in future projects to indicate target endophytes that can be cultured for the production of Huperzine A.