Genetics of the Fungal Endophytes of Locoweed

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Fungal endophytes of locoweed plants produce the toxin swainsonine. When grazing animals consume locoweed plants, they ingest swainsonine which leads to the toxicosis, locoism. The identity of the endophytes and the relationships between fungal endophytes from different locoweed genera and species has been poorly understood. The endophytes are slow growing and have not yet produced a sexual form. The taxonomic identification has been accomplished through morphological characteristics such as colony morphology, growth, conidial length and ontogeny, as well as molecular comparisons using sequence from the ITS, glyceraldehyde phosphate dehydrogenase (gpd) gene, and the mitochondrial small subunit region. These factors, in addition to the production of swainsonine, has led to the establishment of a new fungal genus, Undifilum. The endophytes from locoweed were named Undifilum oxytropis. Efforts are currently underway to distinguish species of Undifilum using characteristics such as colony color, RAPD banding pattern, and sequence from the ITS and gpd regions. The Undifilum isolates from a specific locoweed, ie. Oxytopis lambertii are identical, independent of the location from which they were collected. Undifilum endophytes from different locoweed species show minor genetic variability.