

APPER: Appalachian Plant Propagule & Endophyte Repository

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We propose the establishment of a biorepository for plant propagules (e.g. seeds and spores) and endophytes at Appalachian State University as an economically beneficial strategy to protect Southern Appalachian biodiversity and crop diversity. The biodiversity of the Appalachian region is one of the richest in the country with the mountain forests containing almost 2,000 unique native plant species, and Appalachia having the highest food crop diversity of anywhere in North America. However, there is little formal documentation or preservation of this region's germplasm, and amazingly little work has been done so far to identify the endophytes forming the plant microbiomes critical to plant survival and productivity. Our project aims to create a platform to protect and explore this valuable, yet still largely uncharacterized, resource for research, plant conservation and agricultural applications. Appalachian State University has begun the planning of its Innovation Campus and has chosen a Conservatory for Biodiversity Education & Research as the focal building to be constructed within the next four years. Our goal is for this effort to become an integral part in this new campus initiative aimed at preserving the biological and cultural diversity of this area, while educating the public and creating opportunities for collaborations with agriculture and natural products research and development. Our project would accumulate viable plant propagules, accompanying endophytes and population genetics data to facilitate a multitude of projects, and provide a repository and database that can be augmented and utilized by other scientists in the state and region. We are planning to tie this effort with the existing SERNEC portal (SouthEast Regional Network of Expertise and Collections, <http://sernecportal.org/>), a consortium of 233 herbaria in 14 states in the southeastern US currently funded by the National Science Foundation. We will be able to collaborate with the existing Watauga and Ashe County seed libraries to obtain agriculturally valuable heirloom seeds and the Sustainable Development Teaching and Research Farm to propagate plant material for testing and collection. We predict that this resource will greatly facilitate conservation research, exploration of new plant products, and economic development in North Carolina while preserving the unique biodiversity of the Southern Appalachians.