A Biological Approach to Documenting Traditional Ecological Knowledge in Synchronic and Diachronic Perspectives

This project demonstrates how the methods and outcomes of documenting endangered languages can dramatically expand scientific discovery in other disciplines. In this instance, traditional ecological knowledge of plant life will be documented through linguistic and ethnobotanical field methods through the collection and analysis of discourses on plant life in Sierra Nororiental de Puebla, Mexico. Nahuatl and Totonac, two Mesoamerican languages spoken in the region, will be used in these discussions. Linguistic fieldwork will occur in tandem with DNA barcoding of vegetative plant material to facilitate rapid identification to species of the specimens collected and discussed with native speakers. The diversified interdisciplinary team of individual and institutional collaborators will allow for advances in linguistic, ethnobotanical, and botanical sciences.

The botanical aspects of this project comprised of four steps: (1) collection of flowering specimens that represent the floristic inventory of the Sierra Nororiental de Puebla; (2) identification to species of these voucher specimens; (3) DNA sequencing of up to four regions of the genome of each species to create a DNA barcode reference library; and (4) use of this reference library to facilitate the identification of a small sample of vegetative plant material that will be used to document the nomenclature, classification, and use of local flora in Sierra Nororiental Indigenous villages.

The linguistic and ethnobotanical research conducted in tandem with DNA barcoding will serve to capture traditional ecological knowledge before it is lost. Discussions between project participants and community members with expertise in natural history from five Nahuat and two Totonac villages in the 28 municipalities of the Sierra Nororiental de Puebla will yield extensive digital recordings of local ecological knowledge. The discussions will provide information on nomenclature, classification, and use of local flora (for comparative analysis). These discussions will shed light on the cultural history of linguistic groups, such as the ecology of ancestral homelands; historical patterns of migration and cultural contact (reflected in loans, calques, and shared attitudes and knowledge); and, among dispersed villages belonging to a single language group, the factors that may affect relative retention, loss, and semantic shift in the nomenclature of biotaxa. Moreover, extensive ethnobiological research on Indigenous biosemantics among relatively large sets of speakers in a single village (or in closely related communities) will enhance research on the boundaries and internal structure, the consistency and variation, of cognitive categories in the domain of natural history.