New Biodiversity Informatics Model for Identifying Plants

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What would you want in your Plant Guide?

A conventional flora may consist of a species list, descriptions, identification keys, distribution maps, illustrations, and voucher information, though rarely all of these. If you could produce you own personal plant guide of any specific locality, which of these would you include? Through the integration and augmentation of a wealth of previously compiled digital resources, we are currently developing a highly dynamic virtual flora consisting of all these components. This resource will be comprehensive, yet flexible enough to allow users to produce personal guides of plants only found within their yard.

Spatial Representation of Species List Subsets

The Arizona Virtual Flora Project is currently subdivided into 43 checklists. A spatial representation of these species lists are displayed through the Google Map interface. Double clicking on a checklist marker will automatically open a key primed with the corresponding species list.
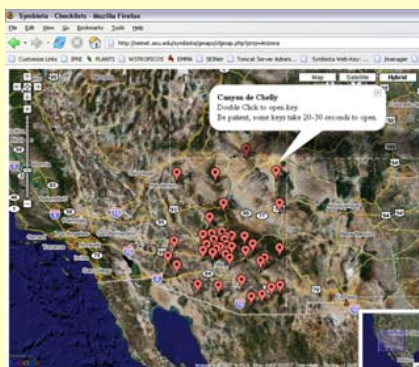
Interactive Multi-state Plant Key

Step 1: Select a geographic checklist

Step 2: Limit species list to a taxonomic group, if possible

Step 3: Create an active species list and retrieve a list of relevant morphological characters

Step 4: Reduce possible identifications using morphology

Step 5: Selecting a scientific name will open the species profile page featured to the right. The Google symbol will open a Google Image page for that particular species

Species Profile Page

Selecting a species name will open the *taxon profile page*. This webpage will show detailed information for that particular species, such as family, synonyms, common name, description, distribution, distinctive images, etc.

Data Entry and Management

Data management via a web enabled interface (PHP) coupled with multi-lingual capabilities truly enables worldwide collaboration and further bridges the gap between the biologist and the data technician.
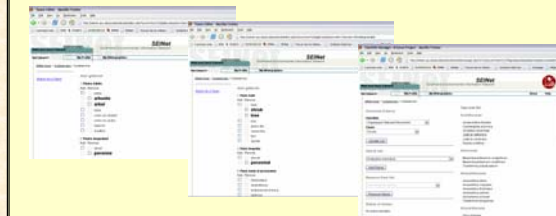
Unique Features of this Model

•**Taxonomic Hierarchy**: Morphological characters are explicitly linked to a taxonomic hierarchy. A character can belong to all dicots, a particular family or genus, or any combination of these. This aids in controlling when characters are displayed. For example, we would not want spine number to be displayed until the majority of the active species list were members of the cactus family.

•**Character Inheritance:** Characters are inherited from parent taxa. For example, all mints species automatically inherit opposite leaf placement from the family (all mints have opposite leaves).

•**Complex Species List:** Computer keys generally control their morphological character list by limiting the key to a specific plant group (i.e. cacti, grasses, etc). Few keys are capable of handling taxonomically diverse species lists without overwhelming the user with character states.

What the Future Holds!

•**Custom Field Guides**: Ability to format a species list into printable field guides for any locality or taxonomic group.

•**Personalized Checklists**: Ability to create custom lists of plants, such as those found around one's home, and save to a personal profile. These species lists could be used within the key, the field guide generator, or any other module.

•**Teaching Tools**: Instructors could establish school yard species lists and use these to teach students about the immediate local flora.

•**Games & Quizzes**: Users could be scored on how well they are able to identify random images from a selected checklist.

•**Integration with Natural History Collections**: Species list generated dynamically from collection data would enable the key to work beyond the predefined checklists. This would allow for the creation of a species list for any well-collected locality.