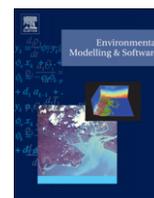Contents lists available at ScienceDirect

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Plantminer: A web tool for checking and gathering plant species taxonomic information

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ABSTRACT

Plantminer is a web tool designed to reduce the effort of compiling, checking, and formatting seed plants species data. It will search for orders, families, authors, synonyms, and make sure that all species in a plant species list exist or are correctly spelled. Plantminer also compares species in pairs, removing duplicated entries, warning the user when there are synonyms in the submitted list, and replacing them by the currently accepted names. The output is compiled in tab-delimited text files, which are compatible with most statistical packages. Plantminer covers seed plant species on a global basis.

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Software availability

Name of software: Plantminer
Developer: Gustavo Carvalho
Contact details: Department of Botany, Federal University of São Carlos, PO Box 676, 13565-905, São Carlos, SP, Brazil. E-mail: gustavo.bio@gmail.com. Fax: +55 16 3351-8308. Year first available: 2008
Hardware required: any computer with Internet access
Software required: any web browser
Programming language: Ruby
Availability and cost: available for use at http://www.plantminer.com and free of charge

"To combine our data, we first matched species names listed in each source with the currently accepted name. This required correcting a tremendous number of spelling errors and resolving synonymy problems" (Chave et al., 2006).

1. Introduction

In the past ten years, Internet popularisation allowed an unprecedented availability of biological data worldwide (Edwards et al., 2000). Unfortunately, this resulted in the arising of many data formats and independent databases (Bisby, 2000). A key problem is the limited ability to access and handle data from several databases in a seamless manner. Thus, even if many plant taxonomic databases exist elsewhere, like World Checklist of Selected Plant Families (2009) (WCSP), Tropicos (2009), and The International Plant Names Index (2009) (IPNI), data compilation is a time consuming activity for the final user, that is, the researcher. Researchers, especially those working with community ecology, conservation biology, macroecology, or meta-analysis, often find themselves compiling lists of seed plants from several different sources. This practice introduces a number of problems, specifically, misspelled names, synonymy issues, duplicated entries, and outdated orders and families, which they need to correct. Compiling this information for a high number of species can take a long time, since these databases often do not allow one to query and compile data for several species at once. In addition, the different ways in which data are presented and made accessible for many of these databases create an additional burden on researchers who seek to apply the available resources to their studies.

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To reduce the effort of compiling, checking, and formatting plants species data, we created an online tool called "Plantminer". We filled two gaps with Plantminer: (1) the lack of a way to check and compile taxonomic information for several seed plant species at once and (2) the lack of a way to crosscheck lists of plant species for duplicated entries and synonymy issues.

2. How it works

To gather taxonomic information of the plant species, Plantminer submits queries to WCSP, Tropicos, and IPNI until the species is found. However, if a species is not found in any databases, the system will, whenever possible, suggest the closest valid name. Finally, Plantminer will classify species following the latest APG classification (Stevens, 2001 onwards) and crosscheck the user list for synonyms, replacing them with the currently accepted name.

3. How to use it

We built Plantminer within a friendly web page (http://www.plantminer.com) containing step-by-step instructions. Basically, there is a form where the user uploads his or her species list as a text file. After that, Plantminer does the hard work and automatically email the results to the user. Resulting files can be compiled in either tab-delimited text files or in the Phylomatic format (http://www.phylodiversity.net/phylomatic/). Another way to use Plantminer is by querying its web services.

4. Conclusion

Plantminer is completely free of charge. All the steps needed by the user to interact with Plantminer, from registration to receiving his or her list back, are well documented in both written and video instructions at Plantminer web page. By using Plantminer, biogeographers, conservation biologists, and ecologists will avoid the tedious, time consuming, and sometimes inaccurate work of manually correcting spelling errors and synonymy problems.

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