The world’s largest database on wild plants is published

09/2011 - Biology. Scientists from CREAF and CSIC have collaborated with scientists from 105 institutions worldwide to gather and sort three million data on 69,000 species of wild plants representative of the 300,000 which are currently described in the five continents. This project has given way to the publishing of the world’s largest database on the main characteristics of wild plants on the planet. The initiative, known as TRY, promises to become an essential tool for biodiversity, ecology and Earth system science research.

Plant traits – their morphological and physiological properties – determine how plants compete for resources, e.g. light, water, soil nutrients, and where and how fast they can grow. Ultimately they determine how plants influence ecosystem properties such as rates of nutrient cycling, water use and carbon dioxide uptake.

A major bottleneck to modeling the effects of climate change at ecosystem and whole-earth scales has been a lack of trait data for sufficiently large numbers of species. To solve this constrain and after four years of intensive development, the first release of the TRY database was published this week in the journal Global Change Biology. In this global task, the scientists Josep Peñuelas, Marc Estiarte, Romà Ogaya Jordi Sardans i Joan Llusià of the Global Ecology Unit CREAF-CEAB-CSIC-UAB have collaborated by providing and arranging data sets from several studies.

“This huge advance in data availability will lead to more reliable predictions of how vegetation boundaries and ecosystem properties will shift under future climate and land-use change scenarios”, points out Dr Ian Wright from Macquarie University.

“The TRY global database also promises to revolutionise biodiversity research, leading to a new understanding of how not only the numbers of species (biodiversity) but also the variation among species in their traits (functional diversity) together affect...
ecosystem functions and services.” Moreover, “TRY global database opens the possibility to analyze world scale datasets and study current hot, both observational and theoretical, controversial topics in ecological research”, points out Prof. Josep Peñuelas director of the Global Ecology Unit CREAF-CEAR-CSIC-UAB.

The availability of plant trait data in the unified global database promises to support a paradigm shift in Earth system sciences. At this regard some studies using TRY database have brought new perspectives in some ecological topics helping to improve some Earth system models. Global vegetation models commonly classify plant species into a small number of plant functional types, such as grasses or evergreen trees, but these do not capture most of the observed variation in plant. Indeed, analyses of the TRY database demonstrate for the first time on a global scale that most of the observed trait variation is represented by differences among plant species. In contrast, plant functional types, such as used in global vegetation models, contribute much lesser to the trait variations, for several traits only as little as 25%. This example illustrates the advantages of trait-based vegetation models, facilitating a more realistic and empirically grounded representation of terrestrial biodiversity in Earth system models. Such models may not only be helpful to predict the development of future climate, carbon sequestration or ocean levels but also to provide a basis for mitigation strategies.

The TRY initiative, developed under the auspices of IGBP (International Geosphere-Biosphere Programme) and DIVERSITAS (International Programme of Biodiversity Science), is unique as a collaborative initiative, too, being at the same time communal and worldwide. TRY initiative is a huge effort to respond to the scale of the challenges we are facing, which demands new ways of doing science, both in terms of the size of the networks and databases, and the high degree of collaboration.

TRY – a global database of plant traits.

Jordi Sardans, Josep Peñuelas, Marc Estiarte, Romà Ogaya, Jordi Sardans i Joan Illusià.

Centre de Recerca Ecològica i d’Aplicacions Forestals

Unitat d’Ecologia Global CREAF-CEAB-CSIC-UAB