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West African Plant Database – a photoguide and identification tool

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Abstract

The West African Plants Database, a new website currently including > 5000 photographs of > 1000 West African plants is presented. It is an internet photo-database as well as an identification help. The photographs can be accessed via browsing a hierarchical list of taxa and/or searching for specific morphological characters. For this identification aid a total of 18 characters regarding flower, fruit, habit, and leaf are encoded. The character search produces a result page with species names and up to three thumbnail images. By clicking on either of them you get to the species page with all available images and further information plus links to further internet databases. The digital photographic documentations are a result of extensive field studies in the course of the BIOTA and SUN projects. The photographed taxa are identified by experienced scientists. This website is accessible for anyone interested in the plant diversity of West Africa (www.westafricanplants.senckenberg.de).

Introduction

The flora of West Africa comprises about 7000 species, according to the Flora of West Tropical Africa (Hutchinson & Dalziel 1954-1972) with a wide variety of different habitats ranging from the Guinean rainforests to the Sahara desert. Although the regional and several national floras (Aké Assi 2001, 2002, Akoegninou et al. 2006, Berhaut 1971-1988) exist, there is still a need for easy-to-use identification tools, which aim not only at expert scientists but also at a wider audience including foresters and park rangers to NGOs, students of the relevant fields and the interested public.

The recent technological advance in digital photography lead to a rapid increase of photographic material during the last 10 years and an improved availability. At the same time, the internet has become a top medium for information retrieval, not only in the rich countries of the North, but also, and with growing potential, in West Africa.

So the idea to develop an online identification tool with digital photographs appeared to us as a logical consequence to respond to the existing needs with the data and photographic material available from our botanical research. We had the first version online in August 2008 (Brunken et al. 2008). Within the first year of its existence, we have not only extended the taxonomic range and now cover a good part of the Flora of the West African savanna region, but continuously improved the database from the experience of using it ourselves and feedback from other users. Our database is the first and only online plant photo guide with determination tools for West Africa.

Structure

Our database consists of basically three types of data: (1) a taxonomical backbone, basically a species list with synonymy included and tables for genus and family, (2) character data for these species and (3) photographs integrated into the previously described structure via the taxon name, but also containing information on photographer, time and locality.

At species level, the taxonomical backbone follows the taxonomy of the African Flowering Plants Database (2008), which is also used by the African Plant Initiative (API) and develops into a standard list for the whole continent. For the assignment of genera to families however, we used Brummit (1992).

Content

The screenshot shows the homepage of the 'West African Plants - A PHOTO GUIDE' website. At the top, there are navigation links for 'Imprint', 'Terms & Conditions', and 'Contact'. The main header features the title 'West African Plants A PHOTO GUIDE' and a photograph of two hands holding orange fruits. Below the header, there is a search bar with the prompt 'What are you looking for?' and a search button. To the left, there are links for 'Browse & Search', 'Help & User's Guide', and 'Project & Partners'. The main content area includes the title 'WEST AFRICAN PLANTS - A PHOTO GUIDE', a description of the interactive guide, a citation for Brunken et al. (2008), and a statistics box. The statistics box indicates that the database currently contains 5848 photos, 1081 illustrated species, and has had 50559 visits since August 2008. At the bottom of the page, there are logos for BIOTA, SUN, Senckenberg, and various universities.

Fig. 1 Start page of the West African plant database with some basic statistics on content and usage. Visits are counted only once per user and day.

Most of our photographic material stems from field work in the context of the BIOTA and SUN projects and is therefore more or less restricted to the sahelo-sudanian savanna belt of West Africa. The Lower and Upper Guinean rainforests are by far underrepresented and are our biggest challenge for the future improvement of the database, but the savanna zone with about 1200 species for the entire Sahel and 2750 species for the entire Sudan (White 1983) is already well documented. We currently have 1081 species documented by 5848 photographs.

For the assessment of character data, we identified a set of 18 easily recognizable characters and assigned the character states from the already mentioned floristic literature, other literature sources, including the very instructive woody plant field guide by Arbonnier (2002) and our own observations from the field, from photographic records and the collections of the Herbarium

Senckenbergianum (FR). The character data is used in an easy-to-use search page, where it is possible to combine taxonomical group affiliation with character states and thereby filter our set of species. The remaining species appear as a list with three thumbnail images per species, usually making it possible to roughly identify a species and confirm this impression by having a closer look at the species page with all photographs and links to other online resources for the species.

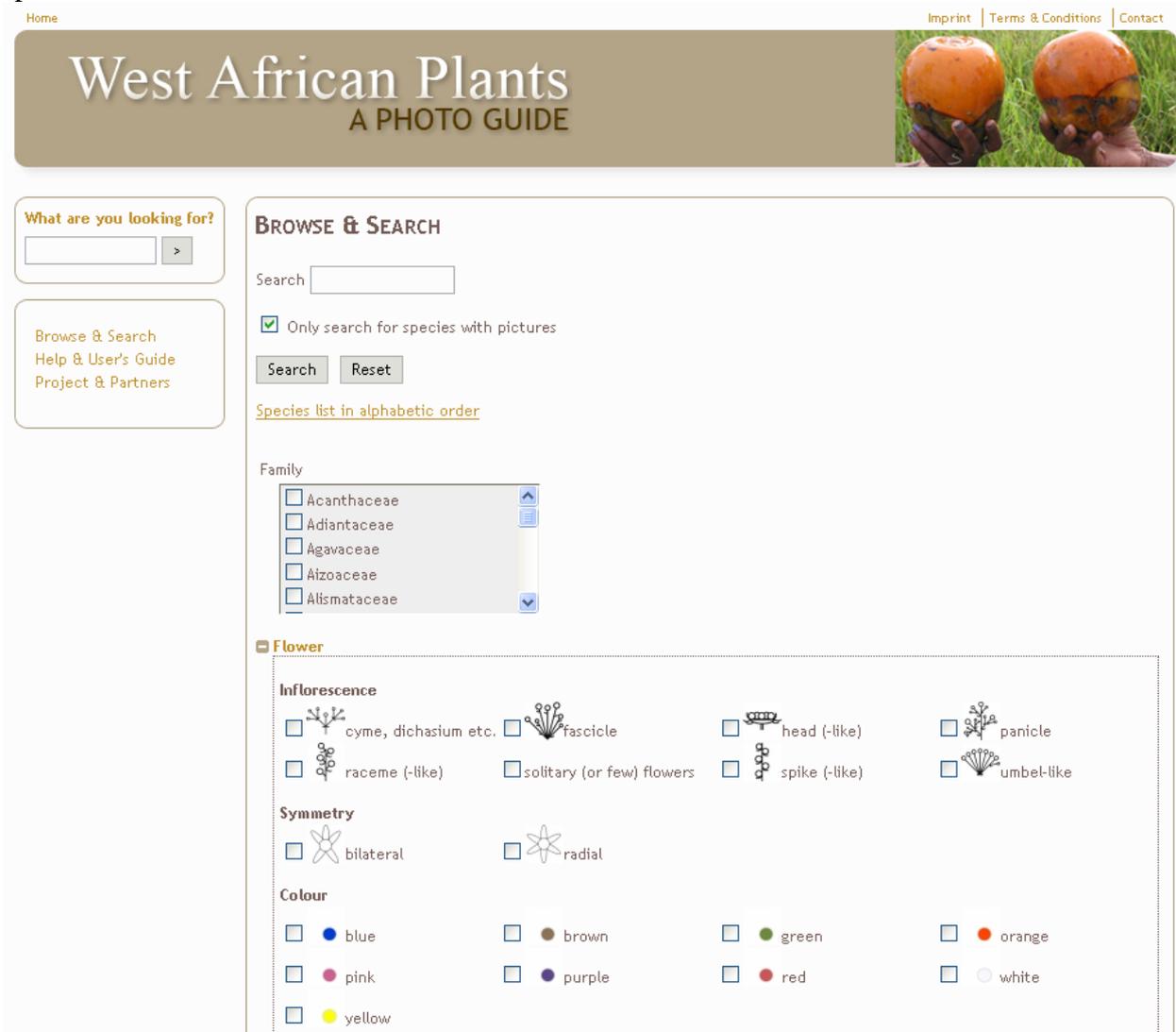


Fig. 2 Search page with taxonomical and character options. Character states are illustrated with instructive symbols to assist the non-expert user.

The West African Plants Database is regularly used, as demonstrated by our access statistics. We currently have about 100 visitors per day and altogether had more than 50,000 visits since our start in August 2008. For field work and use without online access, we also developed an offline DVD version, which is updated once a year.

Outlook

Our most important goal is to broaden the taxonomic base of our database by incorporating missing species of the savanna region and tackling the challenge of including the forest species. Since digital photographs can be easily georeferenced, we will include exact coordinates in the near future, making it possible to provide occurrence data for biogeographical studies (as, e.g., Schmidt et al. 2005, Schmidt et al. 2008). The interlinkage with other botanical databases of the

region will create synergies for each. Finally the simple and effective structure is easily transferable to other regions and taxa.

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