

**Dirección General de Investigación Científica y Técnica, La, Madrid. *Flora Iberica en CD-ROM***  
*Plantas vasculares de la Península Ibérica e Islas Baleares* [on versos booklet t.pp.: *Pteridophyta*]

*Gymnospermae–Angiospermae* (Lauraceae–Monotropaceae)]. Vols. 1–4. Real Jardín Botánico, Madrid, and CSi, Londres 17.2" Dcha., 28028 Madrid, Spain, winter 1996, Span., Eng. booklets each 120x120 mm, 24 pp., ill. (B&W, col.), PB, CD-ROM, plastic storage case for all, no ISBN, **Pt56,000.00**. [Requirements: DOS/Windows 3.11/95 systems: 4 MB RAM, 386 or better machines. **Booklet contents:** setup; intro; indexing; sp. ID; producing lists spp.; saving results; searching; maps, figs.; no index. For contents vols. 1–4 (1986, 1990, 1993, 1993) see *Tmon* 39: 270, 646, 44: 142 and for review vols. 3–4 see F. Sales & I. C. Hedge, *Tmon* 44: 470–472.]

The first electronic flora? The CD-ROM of *Flora Iberica* might seem to be what we have all been waiting for. However, the CD-ROM at **Pt56,000** costs a great deal more than the comparable set of volumes 1 to 4 as books (only **Pt16,000**), and yet **seven** more printed volumes are envisaged. The promotional **brochure** for the CD-ROM claims data for 647 genera, 1639 species, and 376 **subspecies**, "about 25% of the total Iberian flora," supported by 1450 maps and 895 **illustrations**. The booklets provided are in English and Spanish. The English explanations thus **allow** non-Spanish **readers** to follow the **instructions** in the programs, which are **all** in Spanish. The **thesaurus** included in the data has descriptive terms (60,000 claimed) in both languages, so that one can **enter** search terms either way. The installation procedure is simple and quick. The only **problem** encountered was that if one's machine is short of memory, **some** mouse buttons just fail to respond, and one needs to **start** again.

The CD-ROM is based on software called "Personal Librarian" provided by a company called Compact Software **International** (CSi). Personal Librarian is a text-oriented **database** system, and not a relational database. It is **also** not generally available for scientific use. In **order** to set up a project with it, one cannot buy a development kit from **CSi**, but one must **have** a dataset of one's own and then negotiate with them for the production and sale of the CD-ROM. The three main **features** of *Flora Iberica* are (1) a program to **identify** specimens, (2) retrieval of information about taxa, such as descriptions, nomenclature, **and** **distribution** maps, and (3) species checklists by province, by name, or by characters. **Virtually** the whole text of *Flora Iberica* (vols. 1 to 4 published, vols. 5–11 envisaged) and **all** the line drawings are on the CD-ROM and can be accessed. This system **provides** no extra data other than what is already published in the printed flora, but it **does provide** better means of accessing and viewing it, by providing much more indexing. **All** this works well, except for retrieval of anything to do with characters.

One can select a taxon and display distribution maps, with provinces **colored** in according to the source of data. There are no maps in the printed flora, so this is a bonus. One can recall the descriptions of the individual taxa (in Spanish) and **also** the line drawings of them. One can select taxa by area or by taxonomic categories and make checklists from them. Full descriptions of a taxon **and** maps can be printed or saved to file by using **features** of Windows in the usual way.

Identification is possible in three ways: (1) By conventional keys: the questions of the keys in the text of the flora are presented lead by **lead**. One could do this just as **well** with the printed flora. (2) By **fields**: Characters are divided into **classes**, as "leaves" or "flowers," and one can type what one **wants** into boxes provided. Numerical characters cannot be used. This is a rather odd shortcoming of Personal Librarian. (3) **Free** entry: One can type whatever descriptive characters one **likes**, again using either English or Spanish. Searches in modes 2 and 3 can be restricted by selecting a family or a genus. The identification algorithm is **crude** and inflexible by comparison with the various DELTA interactive identification programs that are available. With this CD-ROM one can recall the image of a particular taxon **while** using the program, but no images of characters are provided. There are no options for choosing the next characters. The whole procedure depends on finding words for characters in the text to match those in the **unknown** specimen that one is describing. If these are not in the text, then no match **will** be found. This is not a fault of the program, but of the data that it is using. This is not really a **fair** criticism of *Flora Iberica*, **because** the editors and **authors** were never asked to make their descriptions complete and consistent. It is a general shortcoming of most floras and monographs, but in this case it **badly** spoils the accuracy of any retrieval based on character data.

As a test **example**, I fed in data for a plant that I had in mind, *Ranunculus hederaceus* in *Ranunculaceae*. I specified the family and genus and was told that **there** were 66 species. I then fed in "petals white" (= "petalos blancos") and got a list on the screen of 50 species, not including the species that I had first thought of (the full list can however be saved to file). In **detail**, the list included 8 that **have** white petals, 11 with pale yellow petals, and 24 with yellow petals. (the other 7 species did not **have** flower color stated in the text descriptions). Missing **from** the list were at **least** 8 species having white

petals, but where the text **does** not say so. These 8 species are in section *Batrachium*, and the sectional description accurately notes the **white** petals, but the **program missed** that. **The thesaurus does have** hierarchical knowledge of words that imply **other** words, and this can sometimes give better **results**, but this was not the case with this example. **I** then added three more characters, "plant aquatic," "glabrous," and "prostrate," and then *R. hederaceus* **came** 14th in the **list**. **It** seems that the character for an aquatic was ignored, although **it** is included in the species description under **habitat**. The hairiness of the plant is not given in the description of *R. hederaceus*, and the "prostrate" character was the only one to take effect.

In summary, I must admit to disappointment. **I have** long cherished ideals for a "proper" **database** of a flora (see A. Gómez-Pompa & O. E. Plummer, Video floras: **A** new tool for systematic **botany**, *Taxon* **39:576-585**, 1990), which will **remove** the shortcomings of the printed book, **but** *Flora Ziberica* on CD-ROM is not it. The factual data would **have** to be in relational format, and the descriptive data in DELTA. **All** data files would be complete and the data files in them consistent, so that data retrieval would work **correctly**. There would be abundant image data, with color photos and dot maps, and masses of **all** sorts of data that there **is** no space for in a book. As for **the** means to achieve this kind of product, we **have** most if not **all** the necessary software, but we mainly lack enough good data in electronic form. The CD-ROM would **also** cost much less to manufacture than the books. — R. J. Pankhurst ([richard@rbge.org.uk](mailto:richard@rbge.org.uk)), E