Introduction

Half a century or so ago, with the development of numerical taxonomy, computer technology became a part of systematic botany (Michener & Sokal, 1957; Sneath, 1957a, 1957b). This was a revolutionary approach in taxonomic methodologies. Through rapid advances in computers, network technology and web-based programs, systematic botany has been opened up to the network-space over the last 7 years.

The bases of digital floras, monographs and herbaria are currently being created by taxonomists all over the world. It is reasonable to say that within the next 5 years we will be able to use such floras, monographs and herbaria through Internet facilities and even with mobile telephones. According to Bisby (2000), introducing the Internet into these information systems has created “a chaotic but exciting quiet revolution” in the fields of taxonomy and biodiversity.

Biodiversity Databases in Turkey

Databases documenting the great biological diversity of Turkey started about 2 decades ago. These were designed by the efforts of a few individual scientists. Later, such projects were supported by government organisations. The first database of Turkish plants was created by Babaç (1988a) in 1985. In this database, data on the Tribe Vicieae (Leguminosae) from Elazığ province in East Turkey were recorded and distribution maps prepared on screen using a ‘Commodore 128+’ computer. Later, a floristic database of the Pütürge district of Malatya province was created using the hierarchical database structure written in GWBasic. At the same time, Babaç & Evren (1987) created another

Possibility of an Information System on Plants of South-West Asia with Particular Reference to the Turkish Plants Data Service (TUBIVES)

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Abstract: For quick and accurate access to information about a flora of a country it is becoming increasingly important to develop databases. Databases developed and provided by international organisations are expensive to use and difficult to maintain without outside help. It is therefore important for developing countries to develop their own plant databases best suited to their requirements. One such example is the Turkish Plant Data Service (TUBIVES), designed by Turkish systematists. This database is described with some samples, and the possibility of creating a South-West Asian Plants Information Service (SWAP-IS) is briefly discussed.

Key Words: Systematic botany, database, information system, Internet, Turkey, South-West Asia
database containing the medicinal and industrial plants of Elazığ province, using a commercial database program, dBASEII, and in 1988 Babaç (1988b) developed the first taxonomic database with nomenclature, ecological and distribution data of the Tribe Vicieae in Turkey using dBASEIII+.

The first national database, the Database of Turkish Plants (TUBVET), supported by the Scientific and Technical Research Council of Turkey (TÜBİTAK), contains 21 data fields, and approximately 10,000 taxa (Babaç et al., 1995); the second largest database, the Central Database of Turkish Herbaria (TURKHERB) was started in 1997, with support from TÜBİTAK and the State Planning Organisation (DPT). This database is still in use and maintained. It contains 23 data fields and holds information on approximately 80,000 herbarium specimens from 23 different herbaria belonging to 21 Turkish national universities. Data is entered from herbarium labels (TÜBİTAK-DPT project 1998, pers. com.).

Other databases, a Nomenclatural Database of Turkish Vascular Plants (NOMVET) designed by Doğan (TÜBİTAK project 2002, pers. com.) and one on Turkish Fresh Water Algae (ALGVET) created by Şen (TÜBİTAK project 2002, pers. com.), are not in public use yet.

TURKKRIP, a database of Turkish spore plants started by Babaç in 2001 (supported by TÜBİTAK-DPT), contains several subdatabases on Turkish biological diversity. These are all under preparation and are expected to be completed by 2003. A Turkish faunistic database (Kence, TÜBİTAK-DPT Project 2002) being developed has not yet opened for service. It is agreed that after the completion of the aforementioned databases, BioCes, a Turkish national biodiversity database, will be used to integrate all these.

Turkish Plants Data Service (TUBIVES)
http://www.tubitak.gov.tr/tubives

In September 2001, a data service about Turkish plant diversity was established at the Abant Izzet Baysal University in Bolu (North-West Anatolia), under the name of the Turkish Plants Data Service (TUBIVES), in Turkish. The database, TUBVET (Data Base of Turkish Plants), was primarily used in establishing the TUBIVES system.

In order to access TUBIVES, one must become a user member with a full e-mail address as one’s user name and with a user password. A user name and password, after acceptance of a user’s application, are sent back to applicants with an address with “.edu”, “.org”, “.mil” or “.gov” extensions only and are valid for a temporary period of time. TUBIVES consists of 2 main data-retrieval systems for Turkish plants. These link to the “geographic” or “taxonomic” database searches.

Data Retrieval for Geographic Distributions of Turkish Plants

On this page, the geographic option is used to retrieve data about the geographic distributions of taxa. When the “Geographic” button is selected “Taxon” (Takson) and “Endemics” (Endemik) buttons appear on the screen from which, distribution data of Turkish endemic plants can be retrieved. Information is based on grid squares as used in the Flora of Turkey (Davis, 1965) and according to Turkish provinces (Figure 1). The distributions of the taxa are entered according to the 81 Turkish provinces. The taxonomic page consists of 6 search options: taxa in grid squares; taxa in a province; taxa in either provinces or grid squares; taxa in more than one province; a single taxon occurring in provinces; and a single taxon occurring in grid squares. The same options are present for endemic taxa, plus endemic taxa particular to a single province. These are illustrated by Figures 1 to 3.

Data Retrieval for Taxonomic Information about Turkish Plants

The second main system of TUBIVES has a “Taxonomic” [Taksonomik] option, in which there are two search sub-options: “Independent” and “Dependent”.

On the independent search page there is a form that has to be filled in for data retrieval. In this form, there are 3 columns: fields, show and key words. There are 20 numbered fields in Figure 4. Their English equivalents are: (1) Family, (2) Genus, (3) Species, (4) Species Author, (5) Subspecies, (6) Subspecies Author, (7) Variety, (8) Variety Author, (9) Life Span, (10) Habit, (11) Life Form, (12) Habitat, (13) First Flowering Month, (14) Last Flowering Month, (15) Minimum Altitude, (16) Maximum Altitude, (17) Endemism, (18) Phytogeographic Element, (19) Distribution in Turkey and (20) General Distribution around the World. All of the options under the “Show” column are “No” [HAYIR] as default, except for numbers 3-8 which are “Yes” [EVET]. Any of them may be changed to “Yes” or “No” depending on one’s preference (Figures 4 and 5). At the least, the Genus or Species boxes must be completed. Otherwise, the search result gives an error message.
Figure 1. Taxa occurring in a Province. The black arrow shows the selected province, Van, from where the taxa are retrieved.
Figure 2. When the Geographic option has been selected, the page appearing on the monitor indicates another 2 options: “Taxon” and “Endemic”.
Figure 3. Retrieving a single endemic taxon occurring in provinces. As an example of data retrieval, Abies nordmanniana subsp. bornmuelleriana is selected from the combo-box menu listing all the endemic taxa in Turkey.
Figure 4. Form for retrieving data from the TUBVET database by TUBIVES. This contains 20 data boxes into which key words are entered. The numbers are explained in the text.
Figure 5. An example of retrieving data from the database. Here, taxa belonging to genus Lathyrus occurring at a minimum altitude, above sea level, and at a maximum altitude, below 750 m, are requested. At the same time, data for these taxa from number fields 12-20 have been requested.
In the dependent sub-option, the selections are directed by the program itself. All families reported from Turkey are listed on that page, on which one family may be clicked. The list of the genera belonging to that family then appears on the screen. If a genus is clicked for a selection, all the taxa of that genus from Turkey can be seen. When a taxon name is clicked, then a table containing all the taxonomic information about the selected taxon can be seen, together with its geographic distribution in Turkish provinces and grid squares.

A Suggested Southwest Asian Plants Information System (SWAP-IS)

Most countries in South-West Asia now take an active interest in their biological diversity and are equipped to enter information onto the database. To benefit from this digital environment, it is suggested that the South-West Asian countries should create their own floristic, taxonomic, monographic and herbarium databases and disseminate them. These databases could build into a South-West Asian Plant Information System (SWAP-IS).

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References


