THE ORGANISATION OF PLANTS AND THE GARDEN

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SYSTEMATICS AND TAXONOMY

Systematics is the science responsible for classifying living beings. As subdisciplines, taxonomy is responsible for providing rules and procedures for classification, and nomenclature provides names for organisms, following the rules of a Botanical Nomenclature Code.

The current objectives of systematics are:

- To make an inventory of the world's flora.
- To provide a single name for each plant.
- To provide a method for identifying plants.
- To produce a coherent and universal classification system.
- To clarify the relationships between plants.

Since its inception, systematics has gone through different phases. In each of these phases, plant classification systems were adapted to the scientific knowledge of the time. Today, there are some 360,000 species of plants in the world.

THE ORDER OF THE UNIVERSITY'S HISTORICAL BOTANICAL GARDEN

This garden has maintained the layout of the plants according to the method used by its first director, Mariano del Amo y Mora, in his work Flora fanerogámica (1871-73). This system was based on the classification of the Frenchman A. L. de Jussieu in his Méthode Naturelle des Végétaux (1824), which was the same system used to organise the Botanical School of the Jardin des Plantes in Paris. It considered 15 classes, 14 of which corresponded to the 14 sections of the Botanical School in which this Botanical Garden was structured (class 15, Cryptogams, had no cultivation section).

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During the restoration of the garden (1997), this original order was maintained which, despite being outdated, provides an element of historical and documentary value. Although the classes, subclasses and divisions used by Amo y Mora have been respected, the families nevertheless correspond to a current concept in order to be able to locate the plants correctly.

THE EVOLUTION OF CLASSIFICATION SYSTEMS

1. ARTIFICIAL SYSTEMS

Plants were classified using one or very few characteristics. Their main virtue was simplicity, but they had the disadvantage of placing very different organisms that shared the chosen characteristic together, and separating other related organisms if they differed in that characteristic. Used since Aristotle (4th century BC), the most successful was the one proposed by Linnaeus in 1753. It divided plants into 24 classes according to the type, number, shape of union and length of the stamens. The classes were subdivided into orders according to the female sexual organs. His system was very useful for beginning the inventory of plants and, although it made him a world authority, his current fame is due more to the consolidation of the binomial system of nomenclature.

2. NATURAL SYSTEMS

These classify plants so that those that resemble each other are grouped in the same category. To do this, biologists tried to use as many characteristics as possible, looking for homologous or analogous characteristics among organisms. The problem is that the taxonomic significance of characteristics varies from one organism to another, so that some are more valuable than others. These classifications began with Adanson (1763). One of the most widespread was that of A. L. de Jussieu in Genera plantarum ordines naturales disposita (1789), in which the author recognises and characterises one hundred groups of plants that he called orders, corresponding to the current concept of family, most of which are still accepted today. Shortly afterwards, it was improved by A.P. De Candolle in Théorie élémentaire de la botanique (1819). The philosophy that inspired natural systems remained in force until the end of the 19th century.

3. PHYLOGENETIC SYSTEMS

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The acceptance of the theory of evolution, proposed by Darwin and Wallace in 1858-59, provided a criterion on which to base a true natural classification system: kinship. Living beings should be placed closer to each other the more they share a common ancestor. Systems based on the origin of some species from others are called phylogenetic. In practice, this presents some problems, such as the absence of a fossil record that allows the evolution of many groups to be reconstructed, or the difficulty of interpreting those simple characters that appear primitive but are the product of the reduction of more complex ancestral traits.

Current classification systems continue to use the principles of natural systems, but rely on modern techniques that allow for a much more refined interpretation of characteristics. Techniques such as DNA sequencing allow the degree of kinship between organisms to be established quantitatively, bringing classification systems ever closer to actual phylogeny.

What is in a scientific name? The binomial system

Genus: one word (Latin name, noun)

Species: one word (specific epithet, Latin adjective)

Author(s): who named the species or relocated it to another genus, abbreviated according to standardised forms. Examples:

Thymus granatensis Boiss.

Thymbra capitata (L.) Cav.

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