

*Editorial*

## Scope of plants to land

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### EDITORIAL NOTE

Botany, also called plant science(s), plant biology or phytology, is the science of plant life and a branch of biology. A botanist, plant scientist or phytologist is a scientist who specialises in this field. The term “botany” comes from the Ancient Greek word βοτάνη (botanē) meaning “pasture”, “herbs” “grass”, or “fodder”; βοτάνη is in turn derived from βόσκειν (boskein), “to feed” or “to graze”. Traditionally, botany has also included the study of fungi and algae by mycologists and phycologists respectively, with the study of these three groups of organisms remaining within the sphere of interest of the International Botanical Congress. Nowadays, botanists (in the strict sense) study approximately 410,000 species of land plants of which some 391,000 species are vascular plants (including approximately 369,000 species of flowering plants) and approximately 20,000 are bryophytes. Botany originated in prehistory as herbalism with the efforts of early humans to identify – and later cultivate – edible, medicinal and poisonous plants, making it one of the oldest branches of science. Medieval physic gardens, often attached to monasteries, contained plants of medical importance. They were forerunners of the first botanical gardens attached to universities, founded from the 1540s onwards. One of the earliest was the Padua botanical garden. These gardens facilitated the academic study of plants. Efforts to catalogue and describe their collections were the beginnings of plant taxonomy, and led in 1753 to the binomial system of nomenclature of Carl Linnaeus that remains in use to this day for the naming of all biological species. In the 19<sup>th</sup> and 20<sup>th</sup> centuries, new techniques were developed for the study of plants, including methods of optical microscopy and live cell imaging, electron microscopy, analysis of chromosome number, plant chemistry and the structure and function of enzymes and other proteins. In the last two decades of the

20<sup>th</sup> century, botanists exploited the techniques of molecular genetic analysis, including genomics and proteomics and DNA sequences to classify plants more accurately. Modern botany is a broad, multidisciplinary subject with contributions and insights from most other areas of science and technology. Research topics include the study of plant structure, growth and differentiation, reproduction, biochemistry and primary metabolism, chemical products, development, diseases, evolutionary relationships, systematics, and plant taxonomy. Dominant themes in 21<sup>st</sup> century plant science are molecular genetics and epigenetics, which study the mechanisms and control of gene expression during differentiation of plant cells and tissues. Botanical research has diverse applications in providing staple foods, materials such as timber, oil, rubber, fibre and drugs, in modern horticulture, agriculture and forestry, plant propagation, breeding and genetic modification, in the synthesis of chemicals and raw materials for construction and energy production, in environmental management, and the maintenance of biodiversity. German physician Leonhart Fuchs (1501–1566) was one of “the three German fathers of botany”, along with theologian Otto Brunfels (1489–1534) and physician Hieronymus Bock (1498–1554) (also called Hieronymus Tragus) Fuchs and Brunfels broke away from the tradition of copying earlier works to make original. Observations of their own. Bock created his own system of plant classification. Physician Valerius Cordus (1515–1544) authored a botanically and pharmacologically important herbal *Historia Plantarum* in 1544 and a pharmacopoeia of lasting importance, the *Dispensatorium* in 1546. Naturalist Conrad von Gesner (1516–1565) and herbalist John Gerard (1545–1611) published herbals covering the medicinal uses of plants. Naturalist Ulisse Aldrovandi (1522–1605) was considered the father of natural history, which included the study of plants. In 1665, using an early microscope, Polymath Robert Hooke discovered cells, a term he coined, in cork, and a short time later in living plant tissue.

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