Text-Book of Botany and Pharmacognosy

Kraemer Henry
Title: Text-Book of Botany and Pharmacognosy

Author: Kraemer Henry

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FRONTISPIECE. 1, cell of fleshy scale of bulb of onion (Allium Cepa) showing cytoplasm, nucleus and large central vacuole.

Chloroplasts: 2, a parenchyma cell of green fruit of garden pepper (Capsicum annum) showing cytoplasm, nucleus and chloroplasts; 2a, a chloroplast of a moss (Funaria) showing green granules, assimilation starch granules and protein granules; 2b, a cell near the periphery of the pseudo-bulb of the orchid (Phalaenopsis grandiflora) showing cytoplasm and three reserve starch grains formed by leucoplasts, which latter under the influence of light have developed into chloroplasts.

Chromoplasts: 3, a parenchyma cell of rice fruit of Capsicum annum showing cytoplasm, nucleus and yellowish-red chromoplasts; 3a, isolated chromoplasts of carrot (Daucus Carota).

4, transverse section of petal of wild pansy (Viola tricolor) showing colored cell-sap in epidermal cells.
A

TEXT-BOOK OF BOTANY AND PHARMACOGNOSY

INTENDED FOR THE USE OF STUDENTS OF PHARMACY, AS A REFERENCE BOOK FOR PHARMACISTS, AND AS A HANDBOOK FOR FOOD AND DRUG ANALYSTS

By

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Illustrated with over 300 plates comprising about 2000 figures

FOURTH REVISED AND ENLARGED EDITION

PHILADELPHIA & LONDON
J. B. LIPPINCOTT COMPANY
PREFACE TO FOURTH EDITION.

With each edition of this book the author has found it desirable to make certain changes and additions, not only with the object of increasing its usefulness as a text-book for the student, but also for the purpose of making it still more valuable as an aid and guide in practice. In the present edition a number of improvements have been made in the text as well as in the illustrations. The botanical portion of the book has been revised, the author having been fortunate in securing the cooperation of Dr. Theo. Holm, of Brookland, D. C., who has critically gone over certain portions of the morphology and classification of the Angiosperms and re-written a number of the articles. While there are some teachers who naturally prefer their students to have an independent course in botany before taking up pharmacognosy, the treatment of this subject in this book is such as to be directly applicable to pharmaceutical work, and will be found useful to the student of pharmacy in the college course, as well as of assistance to the pharmacist and analyst who engages in practical pharmacognostical work.

Up until the present time, the anatomical or histological method has received the sole attention of pharmacognosists. By this method, based for the most part upon the study of tissues, the identity and general quality of drugs and foods are ascertained, and the results thus obtained, when taken in conjunction with those of chemical analysis, have been of great value in determining the purity of the products examined. For some years it has seemed to the author important that the pharmacognosist study the active and other constituents of drugs, such as may be obtained in crystalline form from sections, from extractions of
small quantities of powders, or from a few drops of an extracted solution as obtained in assay work. While there are a number of books treating of micro-chemistry, yet the treatment of the microscopic crystals in these is of a general character. The only satisfactory way to study these crystals is by means of the petrographical microscope. In Part IV about forty pages have been included treating of the micro-analysis of some of the important plant constituents, and it is believed that this portion will be especially useful in the detection and accurate study of these substances. In the preparation of this part the author had the hearty cooperation of Dr. Charles Travis, of the University of Pennsylvania, who not only made careful studies of the crystals described, but read the proof very carefully.

The new illustrations include some thirty-five photographs of microscopic crystals; a four-color plate, made from Lumière autochrome photographs, showing salicin and cocaine hydrochloride under the micro-polariscope, with crossed nicols; and a number of half-tone illustrations and drawings of medicinal plants. In addition, the work has been brought up to date by including the results of the researches published during the past two years.

Acknowledgment is cheerfully made to the editor of *Merck’s Report* for permission to use some of the excellent drawings from Dr. Theo. Holm’s articles on “Medicinal Plants of North America.”

H. K.

September, 1910.
PREFACE.

Owing to the rôle played by vegetable substances in the treatment of disease, pharmacognosy takes rank as one of the most important divisions of applied botany. It is generally understood to treat of the external characters, gross structure, histology, and chemical constituents of the plant parts used in medicine. In a broader sense it also implies the study of plants themselves, of systematic botany, and of plant chemistry (phyto-chemistry). Furthermore, when the factors which influence the formation of the active principles in plants are taken into consideration, the subject is seen to have a relation to plant physiology on the one hand and to plant culture on the other.

This work is divided into three parts. Part I comprises five chapters, and is devoted to a consideration of the distinguishing characters of the main groups of plants, from the lowest to the highest; (2) the anatomy or outer structure of the Angiosperms (or so-called Flowering Plants); (3) the inner structure or histology of the higher plants, including the cell-contents; (4) a classification of the Angiosperms yielding vegetable drugs and other useful products, together with concise descriptions of the plants, as also of the non-official drugs derived from them, and (5) the subject of the cultivation of medicinal plants.

Part II comprises two chapters, one devoted to the crude drugs official in the United States Pharmacopoeia, including a few non-official drugs, and another which treats of the subject of powdered drugs and foods. The latter is designed not only for the use of students but also to furnish assistance to food and drug analysts in identifying and estimating the quality of vegetable powders, and includes a description of the distinguishing histological elements of over two hundred food, spice and drug products, together with directions for making examinations of materials of this kind.

In Part III are given the various classes of reagents, together with the technique involved in sectioning and the mounting of specimens. In addition various tests are given in connection with different subjects in other parts of the book.
PREFACE.

The work is illustrated throughout, and the student is advised to consult the illustrations freely, not only on account of their value in elucidating the descriptions, but also because the legends contain information which in some instances supplements that given in the text.

It should be stated that a large proportion of the illustrations are reproductions of photographs and drawings made by the author, and that in all cases where illustrations are borrowed, credit is given each author in connection with the reproduction.

One of the most difficult questions which arises in writing a work of this kind is that relating to nomenclature. Owing to the desirability of maintaining a stable nomenclature, particularly for medicinal plants, the author has adopted a rather conservative course and has been largely guided by Engler & Prantl and Index Kewensis, or, in the case of plants growing in the United States, the names given in Britton's Flora may have been employed.

Among the works consulted by the author, and of which special mention should be made, are the following: Organography of Plants by K. Goebel (English translation by Isaac Bayley Balfour); The Physiology of Plants by W. Pfeffer (second revised English edition by Alfred J. Ewart); Die Heilpflanzen by Georg Dragendorff; The Volatile Oils by Gildemeister & Hoffmann (English translation by Edward Kremers); Die Pflanzen-Alkaloiide by Jul. Willh. Brühl, E. Hjelt and O. Aschan.


The author desires fully to acknowledge the services of Miss Florence Yaple, without whose painstaking and constant assistance during the course of revision, this book could not have appeared in its present enlarged form.

April, 1907.

H. K.
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