

## Preface



Why did I write this book, and why should you read it?

I could state that my motive is that I know plants; I have been teaching their biology at the university for 30 years. However, no truth is absolute, and the preceding statement sounds unacceptably vain and boastful. So to restate: I know, as does the rest of the scientific community involved in the subject, just a small part—a nugget, I would say—of the biology of plants, the part that present-day methods allow us to see and the current theories allow us to assume. This book contains what we accept about plant biology at the dawn of the 21st century. Future generations will learn more.

Let us assume that a university professor's aim is not only to announce the results of his or her research to the scientific community and to distill knowledge of his or her field for students, but also to transfer this knowledge to the general public, which is always an interesting intellectual exercise. The hardest questions asked of a scientist are those that seem naïve on the surface, such as those asked by a child or by a curious, intelligent, and perceptive adult who has nothing to do with the subject at hand—or by an intelligent extraterrestrial who has studied life forms completely different from those familiar to residents of planet Earth. So, how would I explain the biology of plants to my children? Herein lies the intellectual challenge. Especially noteworthy is Einstein's maxim that a scientist has no right to claim he or she knows a subject in depth if he or she cannot explain it to his or her grandmother. Thus, the point of the exercise is to forget yesterday's experiment, to focus one's attention on the essence of things and not on the details, and to lay the foundation for understanding plants, which appear and behave very differently from animals and have shaped life on our blue-green planet. The goal of this book is also to share 30 years of plant study with readers so they can look at plants in a different—and friendly and entertaining—way.

Is the project realistic? Can science be popularised? Can the average person comprehend scientific achievements? One would assume the success of such a project depends, at least initially, on the author, who must directly address the appropriate audience. However, the audience must also be open, willing to learn, and ready to put its cognitive powers into action and its imagination at the service of learning. I believe science is simple; comprehending and generating new knowledge (i.e., scientific research) both require attributes humans already possess. Otherwise, scientific progress as a product of human civilisation would not be possible. What is required first and foremost is common sense; even more necessary, however, is the ability to overturn common sense and the capacity and readiness to discard accepted views and to refute theories when evidence no longer supports them. Moreover, what is required is curiosity about the world surrounding us, which we must comprehend to make the right decisions and to recognise our real place within it. Unfortunately, most humans abandon this innate curiosity before the end of childhood when the first bored, tired, and intellectually apathetic adult squashes us with the phrase “enough of the questions.”

As a university student, I used many methods to silently grade my professors. One of these methods had to do with the way they answered questions considered naïve. Some showed deep knowledge of the subject matter. Others failed, panicked, and surprised me with answers clearly irrelevant to the question, a sign that they themselves had never wondered about it. Some honestly admitted temporary ignorance and were better prepared at the next lesson. Thankfully, only a few answered, “That, sir, you should already know,” with enough sternness and annoyance to prevent similar questions from being asked in the future, lowering student confidence and increasing the distance between

teacher and learner. No one remembers the names of these professors, at least not in a positive light.

Thus, all questions are legitimate, and the most fertile ones are those considered naïve. One of the writer's tasks is to raise such questions and attempt to give answers compatible with our current views on the functions, behavior, and roles of plants, but beware! Not all questions can be answered. Usually, we raise only questions that may plausibly be answered. The others are left pending, swept under the carpet, ignored until they emerge mercilessly when the accumulation of new knowledge returns them to the fore. Therefore, do not shoot the messenger; the writer does whatever is possible to provide you with answers, when answers can be given today, when a question can be formulated. Searching for the truth is no cakewalk. Theories are confirmed until they are refuted. Navigation was carried out successfully for hundreds of years, even though it was based on the view that the earth stood still. What we believe to be true and self-evident today might be shaken tomorrow, because "nature loves to hide" and does not reveal its secrets easily. Our way to approach the truth, which always seems so close yet always evades us, is to study and maintain an attitude of curiosity about and admiration for the world: "Wonder and doubt," as the Delphic exhortation goes. This is when science changes from an intellectual bogeyman to an intellectual game.

Although the reasons presented here may easily explain the author's possible motives, why should readers be interested in plants? This is one of the first questions any reasonable publisher would ask; it might well concern you before you put your hand in your pocket. Why a book about plants? There are several reasons for such a book. First, plants are organisms so different from us we need additional guidance to comprehend their idiosyncrasies. Second, plants have the only broad-scale mechanism for utilisation of a

practically inexhaustible source of extraterrestrial energy. Third, plants comprise 99% of the living mass on the planet. Fourth, plants shaped, are shaping, and will continue to shape the earth's atmospheric composition and hydrologic cycle in a way that is compatible with and necessary for all living organisms. Without plants, life on land, at least in its present form, would be impossible. As the most resilient organisms, plants existed before us and will continue to exist after us. Our energy and metabolic state of affairs depends on them, yet public opinion and many professional biologists—unfairly—consider plants inferior and simplistic organisms with no visible behaviour or intelligence. Finally, there usually is more to plants than meets the eye.

Although this book originally was intended for the general public, *Alice in the Land of Plants* also may be of interest to students of biology or other related sciences. It also might be useful for biology teachers in secondary and primary education, as it might help fill gaps or provide exciting examples for teaching that may lead to students' early realization of the different life-style of plants and their importance to planet Earth. To this end, the extensive use of marginal notes of a questioning, maximal, or categorical nature throughout the book has multiple purposes. The notes highlight essential points, guide the reader through the text, stimulate thought and memory, and serve as a verdict or final judgment on the issue at hand. Together, they comprise a smaller book within the larger one that may be read separately.

To enhance the flow of the main text, reference citations have been avoided. However, extensive general and specific bibliographic references appear at the end of the book.

I thank Dr. K. Zeliou, Professor G. Psaras, and Assistant Professor Y. Petropoulou, my colleagues at the University of Patras, as well as K. Chassourou, my

colleague in secondary education, for the time they sacrificed to read part of the book and offer useful comments; Professor C. Thanos (University of Athens), Dr. T. Kokkoroyiannis, and C. Weber for critical comments incorporated into the second Greek edition; and the University of Crete Press, especially its director, Professor S. Trachanas, Ms. D. Daskalou, Head Publishing Editor, and Mr. N. Koumbias, Scientific Editor—the first two for their positive disposition toward the book’s publication and the third for his particularly apt comments. Finally, I thank the students throughout my 30 years of teaching who always—especially during periods of educational disappointment—made me call out aloud, “Worthy is the price paid.”

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Alice in the Land of Plants

Biology of Plants and Their Importance for Planet Earth

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2012, XVIII, 374 p., Hardcover

ISBN: 978-3-642-28337-6