

*Kronika * Chronicle*

A review of the monograph “Natural Growth Inhibitors and Phytohormones in Plants and Environment”

by Valentine I. Kefeli and Maria Kalevich Edit. Bruno Borsari (Dordrecht/Boston/London: Kluwer Academic Publishers, 2003. 340 p.)

The monograph, edited by Prof. Bruno Borsari, was published in 2003. It contains 340 pages, including 62 figures and 67 tables, and consists of Preface, Acknowledgement, Introduction and ten chapters: 1. System of growth and development regulation in the plant; 2. Natural growth inhibitors and phytohormones under the control of the plant's genome; 3. Natural inhibitors and phytohormones during leaf growth and development; 4. Natural growth inhibitors and phytohormones in the process of cell and organ elongation; 5. Phenolic inhibitors and abscisic acid during dormancy; 6. Catabolism of natural growth inhibitors in the plant and in the abscised leaves; 7. Natural growth inhibitors as allelopathogens and botanical herbicides; 8. Natural growth inhibitors and stress conditions; 9. Natural growth inhibitors and phytohormones in the intact plants and isolated cells, organs and tissues; 10. Natural growth inhibitors and biotests; Conclusion; References; Glossary; Index.

The authors of the monograph present their many-year investigations and theoretical synopses concerning plant growth natural inhibitors and phytohormones and their practical application. The research work of the authors aimed at the elucidation of the functions of active molecules in various groups of growth regulators and dependence of their functions on the environment. The core idea of the monograph is to show a balance between natural inhibitors and phytohormones in plant growth. This approach to studying plant growth phytohormones and inhibitors is grounded on the understanding of their biochemical routes, effects on plant physiological functions considering various stresses in the process of plant ontogenesis. This kind of approach is logical while studying plant growth physiology with re-

gard to the plant–soil interaction and the description of various allelochemicals and their effects on plant growth.

The authors discuss the substances that can regulate plant growth and development, including differentiation, tissue growth and specialization, and organ interactions involving such processes as polarity, regeneration, reaction of the whole plant to the environmental factors (gravity, light, temperature, gas regime), microorganisms, and many others. Some of these substances act as allelochemicals or allelopathogens secreted from the leaves and roots of trees and herbs, and exert effects on other plants. Allelochemicals are relatively stable in the soil and resist the neutralizing effects of microorganisms. Plants in the environment can be recipients and accept the effect of other plants and microorganisms. On the other hand, plants cannot be donors and produce growth-regulating substances which could be secreted and act as botanical herbicides, inhibiting selectively the growth of some species. This might be an ecological tool for the formation of a natural ecosystem.

Thus, hormones and inhibitors can be environmental factors with positive or negative signs and effects. The biosynthesis, transport and function of growth-regulating substances are under the genetic and environmental control.

These targeted centers can act on the cellular level, where growth inhibitors and stimulators can interact with cellular receptors. However, not much is known about the way these receptors are connected with the system of effect enhancement. These processes either integrate cellular receptor effects on the tissue targeting center or function on the organ level.

The reviewers welcome the timely appearance of the monograph of Valentine I. Kefeli and Maria V. Kalevich "Natural Growth Inhibitors and Phytohormones in Plants and Environment", as it is of interest not only for understanding and further studies of the rather intricate problem of the synthesis of plant growth natural inhibitors and phytohormones, but also of the mechanism of their action and interaction with the environment, given that plant growth physiology and biochemistry have been described rather fragmentarily so far. There is the lack of attention to the role of natural growth inhibitors in the tropism–elongation reactions; the conception of the intracellular transport of phenolic and terpenoid inhibitors has not yet been developed.

We hope that the monograph will contribute to a more comprehensive understanding of the effect of natural inhibitors, phytohormones, the en-

vironment and of their interaction. The numerous considerations presented by the authors regarding the effects of phytohormones and inhibitors will stimulate new experiments in the field. Additionally, the educational perspective of the book cannot pass unnoticed as it contributes successfully to the enhancement of teaching and learning in the plant sciences. Finally, and most importantly, the work of Kefeli and Kalevitch will stimulate more debates on the issue and engage the efforts of present and future researchers in an interdisciplinary manner.

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