Luštinec, J., Žárský, V.: **Úvod do Fyziologie Vyšších Rostlin.** [Introduction to Physiology of Higher Plants.] - Univerzita Karlova v Praze, Nakladatelství Karolinum, Praha 2003. [In Czech.] 261 pp. CZK 275.00. ISBN 80-246-0563-5.

This textbook aims to provide students of the Faculty of Science of the Charles University in Prague with recent information on fundamentals of higher plant physiology.

The textbook is arranged into 15 chapters. It opens with an introductory exposition on plant physiology as a branch of science, on physiological traits of higher plants, on plant life as a process (control of life process on metabolic level, and on gene expression level, compartmentation of cell metabolism, plant life and laws of thermodynamics), and molecular genetics as a tool of plant physiology. Chapter 2 deals with structure and function of plant cell [protoplast, nucleus, cytoplasm and plasmalemma, endomembrane system (endoplasmatic reticulum, Golgi apparatus, vacuole), peroxisomes, mitochondria, plastids, cytoskeleton, cell wall, plasmodesmata, cell cycle].

The following chapter discusses the problems of plant and water [water movements in plant (diffusion, osmosis, mass flow), water potential, transpiration flow (soil, xylem, transpiration), root pressure, water deficit, water use efficiency, acclimation to water stress, *etc.*]. Mineral nutrition is dealt with in the next chapter [mineral elements, ion transport, diffusion, transport through membrane proteins (membrane potential, Nernst potential, protonmotoric force, pumps, carriers, channels), transport ways and assimilation of mineral elements, mycorrhizae, carnivorous plants, toxic elements, *etc.*].

Photosynthesis is discussed in the following chapter 5 [leaf and chloroplast as the main sites of photosynthesis, photosynthetically active radiation, photochemical phase (photosystems 1 and 2, ATP and NADPH formation, non-cyclic and cyclic electron transport) and synthetic phase of photosynthesis (C_3, C_4, and CAM plants, photosynthate formation and distribution, photorespiration), photosynthesis and respiration, *etc.*]. Chapter 6 is focused on respiration and its interrelations with photosynthesis (glycolysis, pentose phosphate cycle, Krebs cycle, respiration chain, factors affecting respiration rate, hydrogen in photosynthesis and respiration, *etc.*). Long-distance transport of photosynthates is treated in Chapter 7 (phloem loading and unloading, exchange of substances between phloem and xylem, distribution of photosynthates in plants). Further chapter summarizes formation and mobilization of reserve compounds (saccharides, fats, proteins). Secondary metabolism is summarized in chapter 9 (isoprenoids, phenolic compounds, alkaloids, phytoalexins).

Developmental processes are presented in the following three chapters. In chapter 10, ontogeny is discussed in detail in two parts: Regularity and principles of plant ontogeny (cell growth and differentiation, model of morphogenesis, length of ontogeny, growth and developmental flexibility of plants, dormancy, *etc.*), and Main stages of ontogeny of angiosperms (embryonal, vegetative, generative, ageing and senescence). Further, factors controlling developmental processes (signal transfer, phytohormones, nutrition, temperature, light, *etc.*) and control of developmental processes in plant cultures *in vitro* (cell, callus, protoplast, and organ cultures) are summarized in chapters 11 and 12. Short chapter 13 is devoted to biorhythms (biological clock, photoperiods). Plant movements are discussed in chapter 14. Last chapter presents very important, recent problems of stress physiology: water stress, mineral element deficit, salinity, oxygen deficit and high acidity in soil, xenobiotics, low and high temperatures, high irradiance, stress proteins, *etc.*).

The textbook is well produced, and accompanied with many useful figures. Important information is presented in three appendices: Gibbs free energy and chemical potential, Selected sources of information on the plant biology on internet, and Dictionary of selected terms and abbreviations. In my opinion, the readers would welcome a short subject index, and a list of English equivalents of the terms presented in the Dictionary.

Although the textbook is intended for Czech and Slovak speaking students, it can be also a good source of recent information for other readers, mainly for teachers.

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