Abstract

Light does not serve plants only as a source of energy, but it mediates the information about the environmental conditions and brings signal information for developmental processes taking place in plants. Radiation within the whole spectrum range can be produced by a natural source, or an artificial source. Radiation is percived by a plant due to the whole range of receptors, known as photoreceptors – receptor molecules. Because of photoreceptors plant is able to adapt to its enviromnent and to adjust its metabolism to be as effective as possible. In photomorphogenetic reactions a plant responds mostly to red, blue and partly ultraviolet part of electromagnetic spectrum. For the red radiation there is only one receptor – phytochrome, existing in two various conformations and in several species. Phytochrome is one of the most studied photoreceptors. Blue visible light and partly also ultraviolet radiation is therefore percieved through cryptochromes, which were resistant to research for a long time. In photomorfogenesis there is an enormous difference in plant reactions to light and dark condition. Very different response is observed in various radiation conditions and different physiological events are triggerred and take place. One of the main reactions occurring during change from dark to light conditions is deetiolization, when plant is able to begin or renew its photosyntetic activity. Light signals also serve to entrain circadian biological rhythms and to measure daylength in photoperiodic reakctions. These mechanisms enable an optimal timing of various processes during the day and the year. Movement reactions as phototropisms and photonasties are also controlled by radiation availability. Phototropic reactions are forcing a plant to grow closer to the source. Photonasties are growth movements unspecific to a direction of the light source, but light signal induces physiological responses, which cause movement of different parts of a plant.

The aim of the present thesis in the first part is to provide an introductory information about photomorfogenesis and thus to give background for experiments on the role of radiation in photomophogenesis. This part has been created based on university textbooks and on current scientific articles, with the aim to be used as a teaching material for a highschool teachers.

In the second part it is shown, how can high school students meet the photomorphogenesis issues during theim study. It also brings a summary of documents providing the pattern for current education.The present thesis also deals with an analysis of

vailable current highschool textbooks and if and to ehat extent there is a phenomenon of plant photomorphogenesis dealt with.