

## **Abstract**

The main aim of this diploma thesis was creation of functional experiments and supporting teaching materials for high school students which would clearly demonstrate the processes of photomorphogenesis in plants. Proposed experiments had to be verified in practice on the basis of their reliability, repeatability and reproducibility in schools. It was necessary to draw up the educational materials for each experiment focused on observation of photomorphogenesis plant's reactions. These materials give students the basics of scientific work and specifically they increase the interest in experimental plant biology.

The first part of the thesis is literary introduction that provides the theoretical background to the topic of photomorphogenesis for teachers. It summarizes the current of the art mechanisms and manifestations of photomorphogenesis processes of plants. The second didactic part of the introduction deals with the framing up teaching of plant physiology into current curricula of education in the Czech Republic.

For the formativ of educational materials experiments had to be designed to demonstrate reliably basic photomorphogenetical processes. Three experiments were designe dat: 1. plant phototropism, 2. negative plant phototropism and 3. plant scotomorphogenesis. To select these experiments I set a list of criteria that attempts to guarantee the reliability, simplicity, clarity, demonstrativness of scientific work, feasibility within the school environment and low price.

Verification of teaching materials took place in two pilot grammar schools – Gymnázium Vimperk and Gymnázium Prachatice. Demonstration of experiments and materials was verified through my own personal involvement in pilot schools and also in a form of questionnaires, which I constructed. The questionnaires were aimed at teachers and students of pilot schools and they have have been evaluated and implemented into materials via feedback, which was incorporated in the materials. Protocols were than finalized based on the feedback and may be used for teaching. Besides protocols, other supporting teaching materials are part of the thesis enabling to conduct the teaching lessons at high schools.