

SECRETS OF THE BEAUTY OF FLOWERS AND SOME PROBLEMS EMERGING DURING THEIR INVESTIGATION

Summary

According to the widely accepted hypothesis the parts of a flower originate from leaves. A comparison of the anatomical structure of a leaf with that of a petal and sepal was done for *Physalis ixocarpa* Brot.. The most important adaptation in petals to attract the pollinating insects was found in the structure of epidermis which has papillate cells. Due to such structure the light falling on the petal is highly dispersed after passing through the colored cell interior. This makes the impression of a “deep” color like in the case of velvet. The anatomic structure of sepals in *Physalis ixocarpa* has its peculiarity – the stomata “on the hills”. Pigments of the flowers fall into three groups: carotenoids which accumulate in plastids, and anthocyanins and betalains which are dissolved in vacuolar sap. Anthocyanins are frequently accumulated in special bodies anthocyanoplasts (called also AVI). When investigating the color of flowers the

phenomenon of “post transcriptional gene silencing” was discovered. This led subsequently to the discovery of “RNA mediated virus resistance” and recently to the discovery of the signalling role of microRNAs (miRNAs) and small interfering RNAs (siRNAs). The compounds responsible for the flower’s scent all have small molecular weight and a low boiling point, they belong to various chemical groups. Their main role is attracting pollinating insects but besides, many of them show strong antibacterial and antiprotozoan properties. Flowers of some Araceae produce the plant hormone – salicylic acid which causes the production of heat in the flower and facilitates the emanation of scent. The compounds such as the components of aroma can not be named “secondary” metabolites but “specialized” compounds, since they are also very important for a plant: without them the plant can not reproduce in a generative way.