

## Abstract:

Due to coal mining activities, heap substrates rich in clays with poor water permeability and lack of nutrients are relocated outside of mines representing hostile environment to the majority of vegetation. A material from the surface coal mines in Sokolov forming the Velká Podkrušnohorská Heap (VPS) form large locality showing characteristics of anthropogenically devastated landscape. The aim of the present study was to compare leaf structural and biochemical parameters with relation to a leaf reflectance of two pioneer tree species *Salix caprea* and *Populus tremula* with regard to leaf water regime and leaf adaptation to a water loss. From the methodological point of view, the study aimed on contribution to determine relation of selected leaf structural parameters to leaf reflectance what has not been intensively studied yet.

The foliage of trees *P. tremula* and *S. caprea* grown on succession localities S2 a S3 for 30 years was used as a material for my study. The material was studied for its structure using the leaf cross sections and abaxial epidermal strips (thickness of the leaf tissue layers and of a leaf, stomatal size density and area). Other studied parameters were contents of photosynthetic pigments, specific leaf area (SLA), water potential and leaf reflectance in regions of photosynthetically active and near infrared radiations during the course of six months in vegetation season 2014. Then leaf water potential was related to anatomical parameters corresponding to structural xeromorphic adaptations of foliage.

It is evident that *Salix caprea* showed more xeromorphic character of a leaf in comparison with *Populus tremula*, but at the same time both species showed similar water regime management. Values of the water potential of both species were ranging between -0.5 až -2.3 MPa during the course of the day. The present study indicated that selected intervals of NIR wavelengths correlated with proportional thickness of tissues and leaf thickness depending on a reflected side of a leaf.

Evaluation of physiological state of woody plants could be used for selection of suitable plant species for heap recultivation. The present study also has methodological contribution in search for relation between anatomical structure of leaf epidermis and leaf reflectance, which represents one of the main methods of remote sensing for large monitoring of vegetation status.