

Summary

Photosynthetic Productivity of Ornamental Plants from Village Gardens Used in Vertical Garden

Recently, vertical gardens, i.e. walls covered with greenery cultivated on artificial constructions including a growing medium, such as soil or a substrate, have become popular as additional forms of greenery. Particularly, in densely built areas they deliver air quality improvement, local microclimate benefits and aesthetical value for human health and wellbeing. The aim of the research was to evaluate suitability of various ornamental plants from Polish typical village gardens for use in vertical gardens regarding their photosynthetic productivity.

During three years of researches, species and varieties with the highest survival rate were selected to continue growing on the wall, whilst those with a lower survival rate were uninvolved. Leaf Area Index (LAI), relative pigment content, photosynthetic apparatus efficiency measured by the use of chlorophyll *a* fluorescence technique and gas exchange parameters were analyzed. The conducted research has shown that measurements of chlorophyll fluorescence may indicate in advance the poorer survival capability of plants shown as lower efficiency of photosynthetic apparatus. The most useful parameters for survival prediction were the rate of electron transport flux (further than Q^-_A) (ET_0/RC) and the rate of electron flux at the reducing side of electron acceptors (at the PSI acceptor side) (RE_0/RC). Species with the highest survival were: *Armeria maritima* 'Splendens Perfecta', *Geranium* × *cantabrigense* 'Cambridge', *Heuchera* 'Marmalade', *Heuchera* 'Plum Royale', *Koeleria glauca*, *Lavandula angustifolia* 'Hidcote Blue Strain', *Potentilla fruticos*. Taxsa *Geranium* × *cantabrigense* 'Cambridge'. *Koeleria glauca* and *Potentilla fruticosa*, revealed the highest CO₂ fixation and *Geranium* × *cantabrigense* 'Cambridge', *Koeleria glauca* i *Lavandula angustifolia* 'Hidcote Blue Strain' showed the highest rate of transpiration.

Key words: chlorophyll fluorescence, green walls, LAI, NBI, net photosynthetic rate, ornamental perennials