

## **ECOPHYSIOLOGICAL STUDY OF SUITABILITY OF *PICEA MARIANA* L. FOR AFFORESTATION IN ALKALIZED TERRITORIES IN NORTHEAST ESTONIA**

**M. MANDRE**

*mma@rmk.ee*

Department of Ecophysiology,  
Forest Research Institute,  
Estonian Agricultural University  
18B Viljandi Rd., Tallinn 11216, Estonia

*The present paper is based on experiments carried out with black spruce (*Picea mariana* (Mill.) B.S.P.) in an industrial area in Northeast Estonia. Two-year-old seedlings of black spruce were planted in a sample plot affected by a cement plant and in an unpolluted control sample plot in 1990. At the end of the experiment in 1997 it was ascertained that the impact of industrial alkaline air pollution complexes resulting in the alkalization and chemical deviations of growth conditions decreases the content of carbohydrates and disbalances the mineral element composition in different organs of trees. Changes in the physiology of trees retard the growth and bring about a decrease in total biomass. The sturdiness quotient was higher and the Dickson quality index was lower than the control, indicating serious damages of trees in the polluted area. Increasing share of needles in the total biomass in polluted areas in comparison with control trees suggests that compensation mechanisms were started in trees to increase the assimilating mass in order to survive under stress.*