Influence of Climatic Factors on Annual Rings of Conifers

Katri Ots* and Jüri Rauk

Department of Ecophysiology, Forest Research Institute, Estonian Agricultural University, Viljandi mnt. 18b-508, 11216 Tallinn, Estonia. Fax: (372) 6281599. E-mail: Katri.Ots@mail.ee

* Author for correspondence and reprint requests

Z. Naturforsch. **54c,** 526–533 (1999); received January 18/April 1, 1999

Conifers, Dust Pollution, Alkalised Environment, Radial Increment, Climate Parameters

Relationships of the width of annual rings of 75–85-year old *Pinus sylvestris* L. and *Picea abies* (L.) Karst. with average monthly temperature, amount of precipitation and a complex climatic indicator developed on their basis was studied against the background of pollution load in the zone influenced by a cement plant and in a control area. Multiple regression analysis (equations with two and three independent variables) showed a significant correlation between precipitation and temperatures with increment, especially for pine; however, the prediction capability of the models is modest, describing usually 35–40% of the variation in radial increment. The calculations suggest that precipitation amounts are more important and temperature parameters less important and can be replaced by one another in the models. A direct correlation with the pollution load can be observed: at probability (P) near zero the coefficients for precipitation were the highest (0.45–0.51) in the area strongly affected by the cement plant and the lowest (0.31–0.35) in the weakly affected and control areas. In case of spruce shortage of air humidity during summer months was important for increment, especially so in the heavily polluted area.