

Batic, F. et al (1999): Bioindication of different stresses in forest decline studies in Slovenia; Water, Air and Soil Pollution 116: 377-382, 1999; Netherlands

Reference: Batic, F., Kalan, P., Kraigher, H., Sircelj, H., Simoncic, P., Vidergar-Gorjup, N. and Turk, B. (1999): Bioindication of different stresses in forest decline studies in Slovenia; Water, Air and Soil Pollution 116: 377-382, 1999; Netherlands

Short reference: Batic és mtsai (1999)

First author: Batic, F.

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Abstract

Determination of the stresses operating on a forest ecosystem demands the use of several bioindication methods. Air quality indicators were assessed from an inventory of forest decline based on the assessment of tree crowns and epiphytic lichens. Photosynthetic pigments, ascorbic acid and major macronutrients were studied in Norway spruce needles as indicators of physiological and biochemical stress. Analyses were carried out on selected forest plots in polluted areas (Zasavje district, vicinity of thermal power plants) and predominantly unpolluted areas (Triglav National Park, Julian Alps, Slovenia). For some bioindication methods, there was good agreement with measured air quality and climatological parameters. The best agreement was found between total foliar sulphur in needles and epiphytic lichens, especially in more polluted areas. Agreement with forest decline inventories and analyses of some needle stress physiological/biochemical parameters was less convincing. The strength of agreement was further decreased by soil characteristics and climatic parameters, influenced also by biotic parameters and forest stand history and management. It was concluded that there is no simple bioindication method available to evaluate the vitality of a forest.

[biodiversity](#)

[forest ecology](#)

[sustainability](#)

[environmental impact assessment](#)

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Attached document: [Bioindication of different stresses in forest decline studies in SI](#)

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