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VALIDATING THE CLASSIFICATION MODEL OF FOREST NATURALNESS DEGREE USING THE DATA FROM NATURE RESERVE BABIA HORA

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Abstract:
The paper analyses the correctness of classification of forest naturalness degree using the classification model proposed for spruce altitudinal vegetation zone by Moravčík et al. (2009). The model is based on the predictive disriminant analysis. The indicators of forest naturalness that enter the model are: the arithmetic mean of the ratio between crown length and tree height, the deadwood volume, the coverage of grasses, the coverage of mosses and lichens, Clark-Evans aggregation index, and the coefficient of variation of tree diameters. The validation of the model was performed using the data from 57 sample plots established within the nature reserve of Babia hora. The results of the validation indicate sound conception of the model. The overall correctness of the classification of forest naturalness degree exceeded 60%. Statistical analysis of the results revealed that the model performance is independent from the developmental stage of the natural forest. The significant negative trend in the results was found with an increasing elevation. The proposed classification model can support decision-making about the suitability of the use of given types of forests on biodiversity preservation in connection with the interests of nature and landscape conservation. It can be a supportive tool for decision makers in order to adopt proper measures aimed at the improvement of the state or the decision about the change in the use of forests with evidently low natural values.

Keywords: spruce virgin forest, structural diversity, discriminant analysis

THE WATER DEFICIT IMPACT ON RESISTANCE OF NORWAY SPRUCE (Picea abies (L.) Karst.)

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Abstract:
Considering the unstable precipitation distribution through all year in the Middle Europe, this paper analyses the water deficit impact on resistance of Norway spruce (Picea abies (L.) Karst.) against pests. The resistance of trees against pests is related to microsite water regime. To analyze the water uptake by 80-year-old spruce stand we evaluated time scale data of climate, physiological and hydropedological processes in a plot of 18 sample spruce trees in the area of the Brdy Mountains. The soil moisture $[m^{-3}*m^{-3}]$ and water potential [bar] was recorded at each tree hourly. With soil and bark temperature measurements at six plots consisting of three spruce trees the water regime was performed in August 2008. To assess the influence of edge location three of the sample plots were placed at the edge of the stand (P3, P4, P6) whiles the others inside of the stand (P1, P2, P3). To simulate the water deficit in the stand in two of the sample plots (P3, P4) a roof system was installed. To assess the health condition of the sampled trees the method of macroscopic indicators of crown response to stress was carried twice in 2008. To assess the resistance of trees against pests the manipulated experiment with males of Ips typographus (L.) were carried out. Inoculation experiments were conducted in each experimental plot (P1-P6). The analyzed results of soil moisture and water potential showed an existence of higher water deficit in the two experimental plots P3 and P4 where soil moisture mean exceeded 0.004 m-3*m-3 (±0.003 SD) and 0.0002 m-3*m-3 (±0.0005 SD) respectively. Mean values of water potential for experimental plots P3 and P4 were as followed −10.24