Oral presentation

Determination of model maps for the potential distribution of Anatolian black pine (*Pinus nigra* Arnold.) in natural forest areas in the Black Sea region

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Abstract: The main purpose of this study was to determine potential distribution modelling and mapping of Anatolian black pine (*Pinus nigra* Arnold.) in the Vezirköprü district located at inner parts of middle Black Sea region of Turkey. In accordance with this purpose, presence – absence data of the species was collected from 586 sample areas, which are the size of approximately 100 m x 100 m. On the other hands, environmental variables which are elevation, slope, aspect, bedrock, topographic position index and radiation index for each plot were obtained from the digital maps generated by Geographic Information Systems (GIS). In addition, annual mean temperature (BIO1) and annual precipitation (BIO12) as climatic data which are spatial resolution approximately 752×752 m^2 were downloaded from WorldClim database. Two different non-parametric modelling techniques, Generalized Additive Model (GAM) and Classification and Regression Tree (CART) were used for potential distribution modelling of Anatolian black pine. Similar results were considerably detected from both of these models. In both methods, contributions for the model of elevation and bedrock variables were found more significant than other environmental variables for potential distribution of Anatolian black pine in the district. According to the CART method, the areas are potential distribution for Anatolian black pine if the metasandstone does not exist in the sites above 650 m from sea level or if the metasandstone exists, the temperature is between 7.6-11.0 °C and the slope is more than 23%. Also GAM showed that places where gabbro, ophiolitic melange, serpentine, and mixed material were seen as main bedrock type, sloping sites where average elevation was from 600 m to 1150 m and temperature is between approximately 8.5-11.3 °C were found most suitable for the potential distribution of the species. To determine the performance and validation of these models were also calculated by area under the Receiver Operating Characteristics (ROC) curve. Generated model results for potential distribution areas of Anatolian black pine were statistically obtained suitable for ROC threshold value. Finally, mapping of potential distribution models of Anatolian black pine in the district were visualized by using GIS software.
Keywords: Anatolian black pine, Black sea region, Potential distribution model, Generalized additive model (GAM), Classification and regression technique (CART)