Geophysical Research Abstracts
Vol. 20, EGU2018-18976-1, 2018
EGU General Assembly 2018

Connections between the microclimate pattern and the vegetation structure in forest-steppe habitat

Gabriella Süle (1), János Balogh (1), and László Körmöczi (2)

(1) Szent Istvan University, Gödöllő, Institute of Botany and Ecophysiology, Department of Plant Physiology and Ecology, Hungary, (2) Department of Ecology, University of Szeged, Közép fasor 52, 6726 Szeged, Hungary

Edges between the different ecosystems are important habitats maintaining high biodiversity and having special microclimate pattern. In our study, physiognomic and coenological structure of forest-steppe vegetation were investigated in forest-grassland edges in relation to microclimate patterns in Central Hungary (Fülöpháza region of Kiskunság National Park).

Vegetation sampling and microclimate measurements were performed along 44-48 m long transects. Species cover values were recorded in 0.5×0.5 m quadrates; also humidity, air temperature and ambient light were measured 20 cm high from the ground with a sensor network. Along the transects the topology, other features of the near surrounding area and the changes of the weather were noted down for example clouds' shading and movement. As expected in the south temperate zone, common trend in the edges of forest-steppe habitats is that the microclimates of forest interior, forest edge and grassland are different. Humidity and air temperature are more balanced in the forest interior than in the open grassland. The spatio-temporal microclimate pattern is mainly affected by the physiognomy of the grassland. *Populus alba* root sprouts and *Conyza canadensis* dense population have significant effect on the microclimate pattern. Depending on the exposure of the edge, the microclimate of the edge is similar to forest interior at night and to the open grassland in the daytime.

Since the microclimate pattern is related to the pattern of vegetation patches, we hypothesized that the forest patch's shading made changes in the microcoenological pattern of the herb layer. We found that as compared to the visual detected edges, the discontinuities of the herb layer - obtained by moving split-window analysis - shifted towards the open grassland site if it was northerly exposed. The daytime temperature profile correlated with the location of the microcoenological edge, but the nighttime profile shows correlation with the visual detected edge's line.

The shading effect was also detectable for smaller groups of trees, but there was no significant vegetation structure difference between shaded and open areas in the herb layer. So the microclimate modifying effect of a small group of trees is weaker than the forest patch's, but in this case the effect of exposure is stronger.

As a conclusion we can say that *Populus alba* forest patches show significant effect on the microclimate of open sandy grassland area. In the forest interior these patches stabilize the climatic parameters, they can dislocate the vegetation boundaries from the forest edge in the grass area with their shading effect.