Geophysical Research Abstracts
Vol. 21, EGU2019-13310, 2019
EGU General Assembly 2019

Regular burning leads to degradation in species-rich semi-natural grasslands

Orsolya Valkó (1), András Kelemen (1), Tamás Miglécz (1), Péter Török (3), Balázs Deák (3), Katalin Tóth (1), János Pál Tóth (4), and Béla Tóthmérész (3)

(1) Institute of Biology and Ecology, University of Debrecen, Debrecen, Hungary (valkoorsi@gmail.com), (2) MTA-DE Lendület Functional and Restoration Ecology Research Group, Debrecen, Hungary, (3) MTA-DE Biodiversity and Ecosystem Services Research Group, Debrecen, Hungary, (4) MTA-DE 'Lendület' Evolutionary Phylogenomics Research Group, Debrecen, Hungary

Regulation of plant biomass accumulation is a key issue in effective grassland conservation in Europe. Burning is an alternative tool to regulate biomass dynamics in semi-natural grasslands even in the absence of grazing or mowing. We tested the effects of regular spring burning on the biomass fractions and fine-scale plant species composition of species-rich foothill grasslands in Aggtelek National Park, North-Hungary. There were five regularly burned and five control grasslands in the study; we collected twenty 20×20-cm sized biomass samples from each. We analyzed the main fractions (litter, graminoid and forb biomass), and the species-level biomass scores, and flowering success in the control and burned grasslands. We revealed that fire increased the amount of forb biomass and decreased the amount of litter, which suggested that regular burning might be feasible for regulating biomass dynamics. The non-metric multi-dimensional scaling (NMDS) showed a high similarity of the control and burned grasslands in species composition. However, plant diversity, and the number of flowering shoots decreased significantly in the burned grasslands. In regularly burned sites we found a significant decline of specialist species, as well as of steppic flora elements. Our results showed that besides its positive effect on biomass dynamics, high-frequency burning threatens the overall diversity and specialist plant species in semi-natural grasslands. We recommend that proper fire regimes should be first studied experimentally, to provide a scientific basis for the application of prescribed burning management in such habitats.