Assessing spatial heterogeneity of biomass production in Hungarian grasslands

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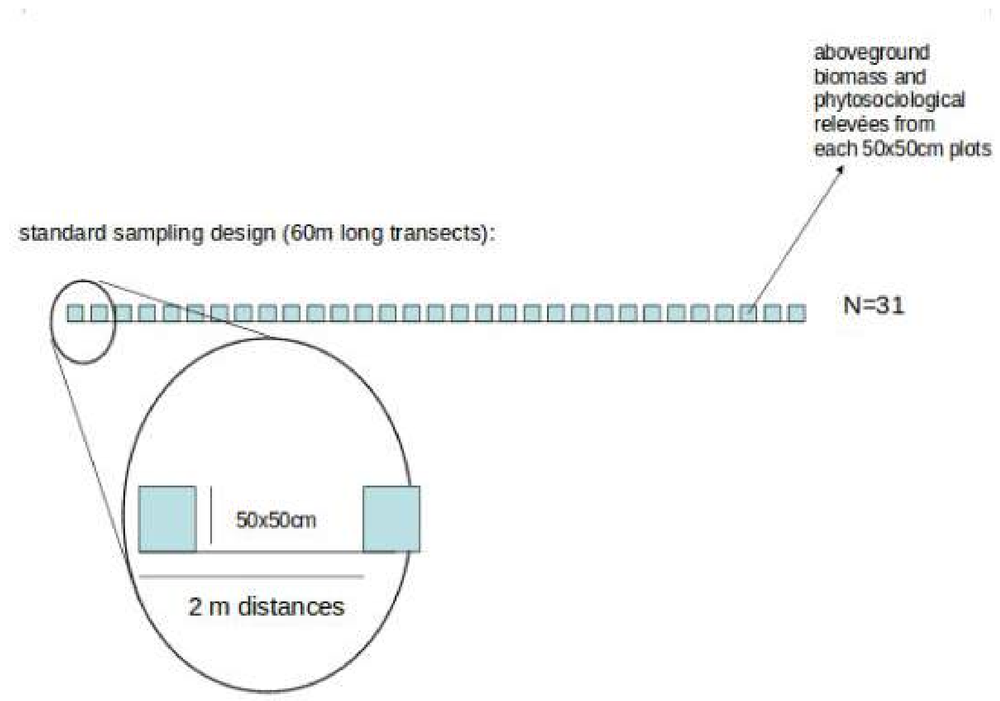
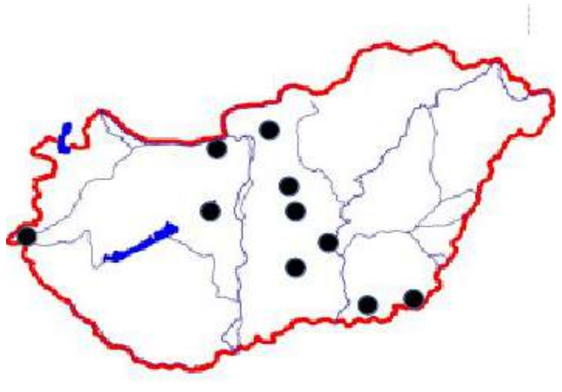
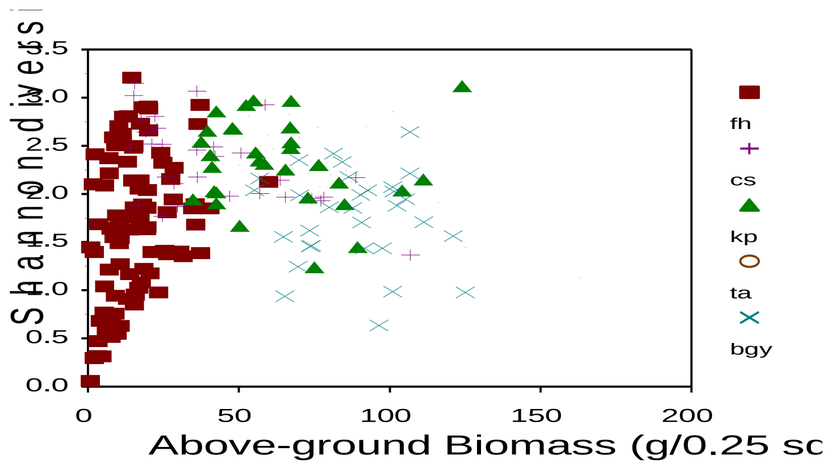
Background & Aims: By studying the functional organization of plant communities we can get information about their stability and, in this context the quality and sustainability of the ecosystem services (e.g. the amount of biomass production). In our study we assessed grasslands of different types, dynamical states and diversity focusing on the amount and spatial variation of biomass.
Our aim was to develop easily measurable indicators for characterizing grassland communities from the point of view of functioning and the quality of ecosystem services. We studied sandy and loess grasslands, steppe meadows and old fields (altogether 40 transects at 10 sites distributed across Hungary).



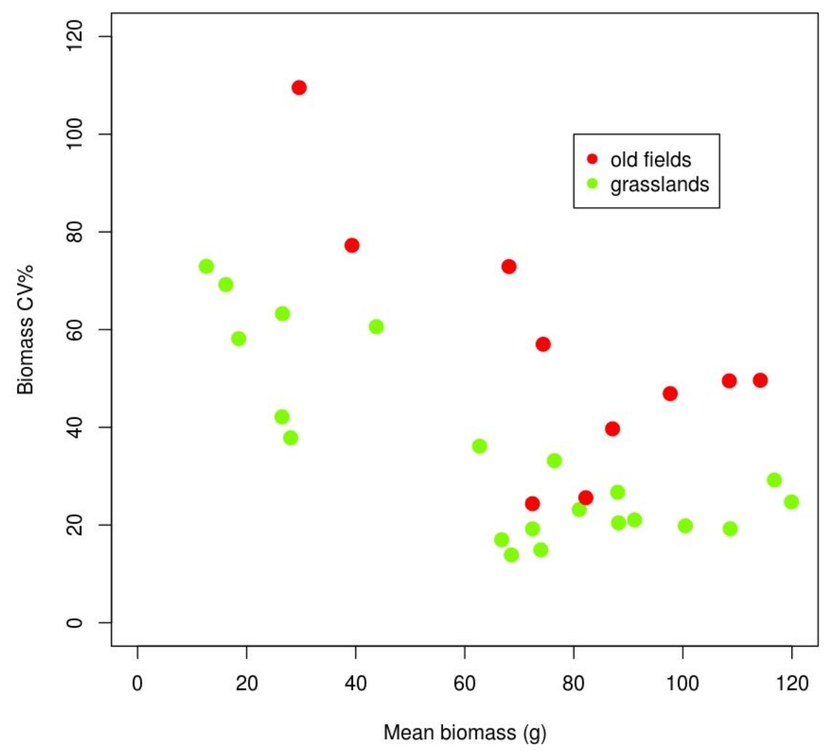
Material & Methods: Above-ground biomass was sampled in 50 cm x 50 cm quadrats together with coenological relevés. At each site the sampling design consisted of 31 quadrats arranged regularly at 2 m intervals along a 60 m transect. The high number of samples gives possibility to describe the inner variation of the different grasland types. For data analyses the coefficient of variation (CV%) of biomass and the alpha and beta diversity of coenological data were compared. The seasonal dynamics of biomass was monitored monthly (between March and August) at three sites.



Results: If we compare production and diversity, it can be seen that diversity was increasing with productivity at the beginning, it reached its maximum at medium productivity and when production became higher, diversity decreased.



The coefficient of spatial variation decreased while the increase of mean biomass was seen in natural grasslands. However, this trend did not appear in old field vegetation. In case of old fields the CV% of biomass proved to be higher compared to natural grasslands.



These preliminary explorative results can be foreseen appropriate to indicate the state, organization and naturalness of the plant communities. For further results we will compare coenological structure of the vegetation and spatial variation of the biomass.

The survey was founded by OTKA K 105608 project (Hungary).