Vegetation investigation of cattle pastures in the Ipoly Valley, Dejtár

Ildikó Járdi-Turcsányi – Károly Penksza – Eszter S. Falusi
Department of Botany, Hungarian University of Agriculture and Life Sciences, Gödöllő
ildikojardi@gmail.com

The most natural and appropriate way to preserve the biodiversity of grasslands is the utilization, which is confirmed by current research. Conservation management requires intensive cooperation between nature conservation and intensive grassland utilization. Therefore, we investigated the effect of extensive grassland utilization on the outskirts of Dejtár.

In Hungary, sample plots can be found along the River Ipoly. To study the effect of grazing in the Dejtár area, vegetation surveys were carried out by Braun-Blanquet (1964) using 2×2-meter squares. However, the species cover value is given in%. The coenological survey was conducted in 2015 and 2020. Two grasslands have been grazed since 2010.

One of them was beef cattle (C: Charolais) pasture while the other area was a Hungarian Grey cattle pasture (G). Two vegetation types were analyzed on both areas. The Charolais pasture was mowed before 2000. Here one sour sandy vegetation (C1). *Corynephorus canescens* is a typical species of sandy grassland that is calcareous, and a lower-lying, characterless, *Elymus repens* dominated grassland area (C2), with fresh and dry patches were examined. The dominant *Festuca* species were *Festuca rupicola* and *Festuca ovina*.

The second pasture were also two types of vegetation analyzed on the Hungarian Grey cattle areas. One of them was a drier steppe under less pressure grazing (G1). The dominant *Festuca* species was *Festuca rupicola.* The other one was a heavily used, degraded steppe (G2) which has been used serving as a resting place. The dominant *Festuca* species was *Festuca pseudovina.* The pastre has been grazed with Hungarian Gray cattle for about 30 years. In the less-used area (G1), there is a steppe. Where the area is severely degraded, the area used by the animals as a resting place was also isolated. There was also the highest quantity of nearnatural species, and protected plant was also found in these sample quadrats.

According to the distribution of Pignatti of species (Pignatti, 2005), the presence of perennial herbaceous species (H scap) was the highest in Hungarian Gray cattle pastures (G1). The presence of one-year-old rising plants increased in the second in the degraded steppe (G2) intensive resting area. The presence of rhizome-rich geophytons was most prominent in the Charolais area (C2), due to *Elymus repens* and biennial species also appeared in this area.

Analyzing with Simon's conservation categories (Simon, 2000), weeds and accompanying species are most prominent in the Charolais area. The Gray Hungarian cattle area has the highest proportion of natural disturbances. They are followed by weeds and then by the association species. The Gray Hungarian cattle (G2) area naturally shows a high proportion of disturbance tolerances, followed by weeds and accompanying species. We can say that the weeds of the examined areas are very high. Protected plants occurred only here (G1). However, with the exception of the Charolais (C1) area, all three of these species also contain natural association-forming species.

The distribution of the sample area of the Gray Hungarian cattle pasture (G1) is dominated by groups 1-3, ie drought tolerant plants (Borhidi, 1995). The intensive grazing (G2) area of the Gray Hungarian cattle graze shows the greatest diversity, and here we find the most categories in the assessment of water demand (Halász et al., 2016; Valkó et al., 2012, 2014; Fülöp et al., 2020, 2021). There are even plants typical of wet (7) habitats.

The relative nitrogen demand assays were in the charolais (C1) area, most of the plants in areas of high nutrient deprivation are observed (Borhidi, 1995). The plants of mesotrophic habitats (5), followed by plants characterized by extremely nutrient-poor (1) habitats. Plants of nutrient rich areas (7) are the largest group in the charolais (C2) plot. They are followed by plant groups characterized by high nutrient-poor production areas (2) and moderately oligotrophic production sites (3). The first sample area of the Gray Hungarian cattle pasture (G1) is dominated by plants with high nutrient deprivation (2) and moderately oligotrophic production areas (3).

There was a significant amount of species adapted to disturbance in each plot, but their proportions were different (Borhidi, 1995). The lowest rate was observed in the quadrats of pastures of the Grey Hungarian cattle under smaller grazing pressure (G1). Some autor has compared the effects of the grazing of Gray Hungarian cattle found that the first is the most suitable for nature conservation management (Járdi et al., 2017; Mecséri and Szabó-Szőllősi, 2021; Penksza et al., 2010; Szabó et al., 2010, 2011; Kárpáti et al., 2004; Viszló, 2012). Hungarian Gray cattle can stay outside for longer, it requires less human intervention (Kovácsné Koncz et al., 2015, 2017), it accustomes well for extreme conditions, the driest small Festuca areas (Penksza et al., 2010, 2013; Szentes et al., 2009, 2012; Viszló, 2012), the more gentle grazing of the grey cattle, increases the diversity of the habitat (Szentes et al., 2009; Török et al., 2014, 2018; Tasi et al., 2014; Pápay, 2016; Pápay and Uj , 2012).

Relative water and nitrogen indicating plants appeared in the Elymus repens dominated area of the Charolais pasture (C2) which refers to higher disturbance. The evaluation of the distribution of species according to Pignatti life form analysis made clearly detectable the different intensity of grazing pressure. Due to grazing, the number of species with rosette was significant in each plot. Additionally, the amount of crawling stems was outstandingly high but the highest was at the resting place (G2) exposed to strong grazing pressures. On the basis of the recordings, on the Charolais pasture the sour sandy lawn (C1) was more sensitive, where the grazing pressure should be monitored in order to preserve the characteristics of the vegetation. On the fresh area of Charolais pasture (C2) grazing after mowing favored the appearance of species characteristic of natural vegetation (Tasi, 2018, 2019, 2020; Viszló, 2012).

The work was supported by OTKA K-125423 and the Higher Education Institutional Excellence Program (NKFIH-1159-6/2019) awarded by the Ministry for Innovation and Technology.

Keywords: *Charolais, Gray Hungarian cattle, Festuca psammophila series, sandy vegetation*

REFERENCES

Borhidi, A. (1995): Social behaviour types, the naturalness and relative ecological indicator values of the higher plants in the Hungarian flora. Acta Bot. Hung. 39, 97-181.

Braun-Blanquet, J. (1964): Pflanzensoziologie. Spingerverlag, Vienna, Germany, pp. 23-76.

Fülöp B.-Pacsai B.-Bódis J. (2020): Az esetleges természetvédelmi kezelések szerepe a botanikai értékek megőrzésében – Esettanulmány a Balaton partjáról. Gyepgazdálkodási Közlemények 18: 15-23.

Fülöp, B.-Pacsai, B.-Bódis, J. (2021): Minor Treatments Can Play a Significant Role in Preserving Natural Habitats and Protected Species on the Shore of a Central European Lake .Agaronomy 11(8): 1540, 12 p.

Halász, A.-Nagy, G.-Tasi, J.-Bajnok, M.-Mikoné, J. E. (2016): Weather regulated cattle behaviour on rangeland. Applied Ecology and Environmental Research 14(4): 149-158.

Járdi I.-Pápay G.-Fekete Gy.-S-Falusi E. (2017): Marhalegelők vegetációjának vizsgálata az Ipoly-völgy homoki gyepeiben. Gyepgazdálkodási Közlemények 15(2): 9-21.

Kárpáti B.-Sarudi Cs.-Csorbai A.-Marton I. (2004): A magyar szürke szarvasmarha tartásának ökonómiai és környezetgazdálkodási elemzése. Acta Agraria Kaposváriensis 8: 33-49.

Kovácsné Koncz N.-Béri B.-Deák B.-Kelemen A.-Radócz Sz.-Valkó O. (2015): Mély fekvésű gyepek élőhely kezelése különböző szarvasmarhafajták legeltetésével. 27. Georgikon Napok, Cikkadatbázis. 225-234.

Kovácsné Koncz N.-Penksza V.-Posta J.-Béri B. (2017): Különböző szarvasmarhafajták legelői viselkedésének összehasonlító vizsgálata hortobágyi szikeseken. Gyepgazdálkodási Közlemények (2): 29-36.

Mecséri, G.-Szabó-Szőllősi, T. (2021): Phytosociology investigation on the gray cattle forage neighbouring Belső Lake in Tihany Peninsula. Gyepgazdálkodási Közlemények 19: 29-30.

Pápay G. (2016): Cserjeirtás után magára hagyott, legeltetett és kaszált gyepterületek vegetációjának összehasonlító elemzése parádóhutai (Mátra) mintaterületen. Gyepgazdálkodási Közlemények 14(2): 37-48.

Pápay G.-Uj B. (2012): Természetvédelmi élőhelykezelés hatása a gyöngyösi Sár-hegy gyepterületeinek vegetációjára. Gyepgazdálkodási Közlemények, (1-2): 39-48.

Penksza K.-Szentes Sz.-Loksa G.-Dannhauser C.-Házi J. (2010): A legeltetés hatása a gyepekre és természetvédelmi vonatkozásai a Tapolcai- és Káli-medencében. Természetvédelmi Közlemények 16: 25-49.

Penksza K.-Házi J.-Tóth A.-Wichmann B.-Pajor F.-Gyuricza Cs.-Póti P.-Szentes Sz. (2013): Eltérő hasznosítású szürkemarha legelő szezonális táplálóanyag tartalom alakulás, fajdiverzitás változása és ennek hatása a biomassza mennyiségére és összetételére nedves pannon gyepekben. Növénytermelés 62(1): 73-94.

Pignatti, S. (2005): Valori di bioindicazione delle piante vascolari della flora d'Italia. Braun-Blanquetia 39: 1-97.

Simon T. (2000): A magyarországi edényes flóra határozója. Nemzeti Tankönyvkiadó, Budapest, Hungary

Szabó G.-Zimmermann Z.-Szentes Sz.-Sutyinszki Zs.-Penksza K. (2010): Természetvédelmi és gyepgazdálkodási vizsgálatok a Dinnyési-Fertő gyepeiben. Gyepgazdálkodási Közlemények 8: 31-38.

Szabó G.-Zimmermann Z.-Bartha S.-Szentes Sz.-Sutyinszki Zs.-Penksza K. (2011): Botanikai, természetvédelmi és gyepgazdálkodási vizsgálatok Balaton-felvidéki szarvasmarhalegelőkön. Tájökológiai Lapok 9(2): 431-440.

Szentes Sz.-Wichmann B.-Házi J.-Tasi J.-Penksza K. (2009): Vegetáció és gyep produkció havi változása badacsonytördemici szürkemarha legelőkön és kaszálón. Tájökológiai Lapok 7(2): 319-328.

Szentes, Sz.-Nagy, A.-Sutyinszki, Zs.-Házi, J.-Penksza, K. (2012): The change of wet grasslands in extreme climate-rainfall along the River Ipoly (Hungary) Növénytermelés 61: 271-274.

Tasi J. (2018): Legeltetési módszerek, Magyar Állattenyésztők Lapja, 2018/12: 38-39.

Tasi J. (2019): Gyepek gyomnövényei, Magyar Állattenyésztők Lapja, 2019/07: 19-21.

Tasi J. (2020): Az okszerű gyephasználat szerves része a legeltetés. Magyar Állattenyésztők Lapja. 25(2): 32-33.

Tasi J.-Bajnok M.-Halász A.-Szabó F.-Harkányin Székely Zs.-Láng V. (2014): Magyarország komplex gyepgazdálkodási adatbázis létrehozásának első lépései és eredményei, Gyepgazdálkodási Közlemények (1-2): 57-64.

Török, P.-Valkó, O.-Deák, B.-Kelemen, A.-Tóthmérész, B. (2014): Traditional cattle grazing in a mosaic alkali landscape: Effects on grassland biodiversity along a moisture gradient. PLoS ONE 9 (5): e97095

Török, P.-Penksza, K.-Tóth, E.-Kelemen, A.-Sonkoly, J.-Tóthmérész, B. (2018): Vegetation type and grazing intensity jointly shape grazing on grassland biodiversity. Ecology and Evolution 8: 10326-10335. doi/full/10.1002/ece3.4508

Valkó, O.-Török, P.-Matus, G.-Tóthmérész, B. (2012): Is regular mowing the most appropriate and cost-effective management maintaining diversity and biomass of target forbs in mountain hay meadows? Flora 207: 303-309.

Valkó, O.-Török, P.-Deák, B.-Tóthmérész, B. (2014): Prospects and limitations of prescribed burning as a management tool in European grasslands. Basic and Applied Ecology 15: 26-33.

Viszó L. (2012): A természetkímélő gyepgazdálkodás, Pro Vértes Természetvédelmi Közalapítvány, Csákvár, 16 p.