INFLUENCE OF ALTITUDE ON PASTORAL VALUE IN HILLS' AREA FROM WESTERN ROMANIA (CASE STUDY)

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Abstract: *Pastoral value is influenced by many factors, one of them being the altitude. The purpose of this research is to highlight the influence of altitude on pastoral value in hill permanent grasslands. The researches were developed during 2001-2004 on 3 permanent grasslands from Şiria (Arad County). The altitudinal interval analysed in this work is 100-500 m a.s.l., respectively 100m, 200m, 300m, 400m and 500m. The method used for vegetation analysis is quadrate point method that helped us to the calculation of pastoral value (VP). The statistical methods used are linear regression and correlation coefficient. At 100m vegetation has a low pastoral value (12-26). The situation at 200m is similar, due to the important contribution of weeds and species without forager value. At 300m VP is still characteristic for low quality grassland but is getting better in comparison with the altitude levels mentioned previously. In the case of 400m and 500m altitude levels VP has the same evolution as was determined for 100m altitude level, this index getting degrading powerfully during the short period of the research. Degradation of the vegetation sward at all altitudinal levels considered in this research is due to the greatest contribution of weeds and species without forager value. Other decisional factor that is leading to the degradation of grassland vegetation is the lack of minimal maintenance works applied and the free grazing. Analysing the correlation coefficient between the altitude interval 100-500m and VP, there wasn't found any interrelation (r = 0.08). Thus, regarding the influence of altitude levels for the 100-500m interval, the values of this index are heterogenous. This fact can be explained by the consistent presence of the species from other families at all altitudinal levels studied here.*

Key words**:** *hill grassland, pastoral value, altitude*

INTRODUCTION

Most of the Romanian researches regarding the altitudinal gradients influence on grasslands are referring mainly to mountain grasslands. In conformity with the researches of MARUȘCA (2001) regarding mountain grasslands, at every 100m decreases yield with 100 kg DM/ha , but there weren't done remarks regarding the evolution of the pastoral value.

Other researches show that there isn't a direct correlation between the yield level and its quality (MOISUC *et al*., 2002). Other authors advanced the idea that the greatest species number is found where the yield has a medium level (GRIME, 1979; PETEERS *et* JANSENS, 1998).

In conformity with the results obtained by COPANI *et al*. (2008), the species with the highest fodder value are frequently reported in the most elevated site.

According with the results obtained by D'OTTAVIO *et al*. (2005) on mountain pastures from Monti Sibilini, the potential pastoral value is powerfully influenced by the abundance of good forage species growing in the pastures.

The purpose of this work is to identify the dynamics of pastoral value (VP) depending by the altitudinal levels on 100-500m interval at every 100m.

MATERIAL AND METHODS

Grasslands studied in this work are placed in the area of Şiria locality from Arad County (western Romania). The data were collected during four years in 2001-2004 interval on the altitudinal levels comprised between 100-500m in five altitudinal levels from 100m to 100 m. The vegetation surveys were realised using quadrate point method (Daget *et* Poissonet, 1971). The data obtained were used for the calculation of the pastoral value (VP) after the formula:

$$VP = \sum_{i=1}^{n} (VS_i \, x IS_i) / 5 \quad (1)$$

where:
VP – pastoral value (0 – 100 scale);
IS_i – specific index;
i – species;
n – species number;
5 – maximal mark accorded;
VS – specific abundance estimation as specific volume calculated after the formula:

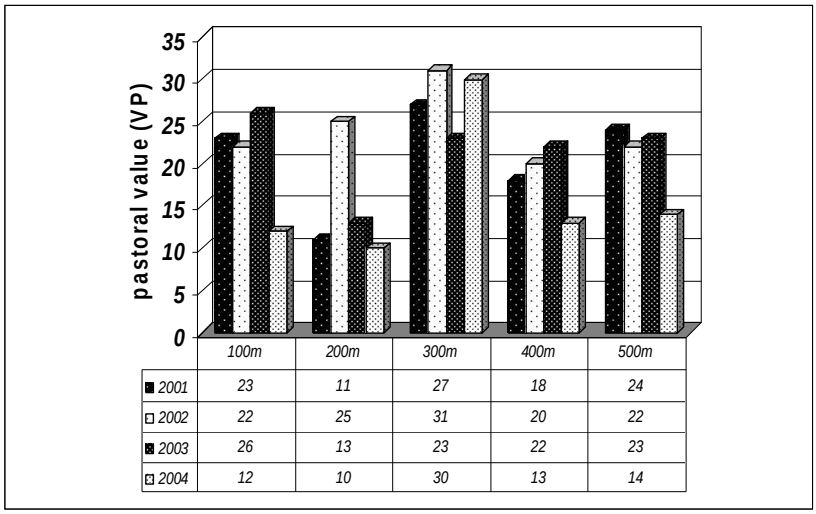
$$VS\% = (C_i/C_{tot})x100 \quad (2)$$

where:
VS% = specific volume;
C_i – number of coefficients given to *i* species;
C_{tot} – total number of given coefficients (MOISUC *et al.*, 2001).

The statistical methods used are linear regression and Bravais – Pearson correlation coefficient.

RESULTS AND DISCUSSIONS

The evolution of the calculated values of VP obtained during the researches at the given altitude levels are presented in figure 1.



	100m	200m	300m	400m	500m
2001	23	11	27	18	24
2002	22	25	31	20	22
2003	26	13	23	22	23
2004	12	10	30	13	14

Figure 1: Pastoral value evolution on altitude during the research period (2001-2004)

At 100m altitude level vegetation is dominated by two species (*Festuca rupicola* and *Agropyron repens*), an important contribution in the vegetation cover have the species from other botanical families as *Eryngium campestre, Euphorbia cyparissias, Rosa canina* or *Rubus caesius.* The VP at this level has a low value (12-26), fodder quality getting degrading till to the end of the researches.

At 200m level vegetation is dominated by *Festuca rupicola*, an important contribution having *Agrostis tenuis* and *Anthoxanthum odoratum.* In comparison with the 100m level the weeds are present mainly as sporadic individuals, but with all these the quality of the vegetation is very low VP being comprised between 10 and 25.

At 300m level vegetation is dominated by *Festuca rupicola*, but high contributions have *Anthoxanthum odoratum* and *Luzula arvensis* too. From the species representing other botanical families the most frequent are *Eryngium campestre*, *Euphorbia cyparissias*, and *Rubus caesius*. Also, the VP that was calculated for this altitude level is comprised between 27 and 31, being the best in comparison with the other altitudinal levels analysed here.

At 400m level the dominant species are *Festuca rupicola* and *Chrysopogon gryllus*. The contribution of the species from other botanical families is important, being comprised between 50% and 77%. The results regarding the VP calculated during the research show at this level that at this altitude studied grassland is much degraded, the values obtained being comprised between 13 and 20.

At 500m level vegetation is dominated by *Festuca rupicola* and *Chrysopogon gryllus*. The percentage of the species from other botanical families is similar with that registered at 400m level, being comprised between 50% and 80%. Regarding the VP index, there is the same degradation trend the results obtained being comprised between 14 and 24.

A general remark is that the low VP obtained at all altitudinal levels studied in this research is due to the important contribution in the grassland sward of a great volume of species without forager value and weeds.

Another aspect analysed here is the influence of the altitude on the pastoral value of the grasslands from Şiria on 100-500m altitude interval (figure 2).

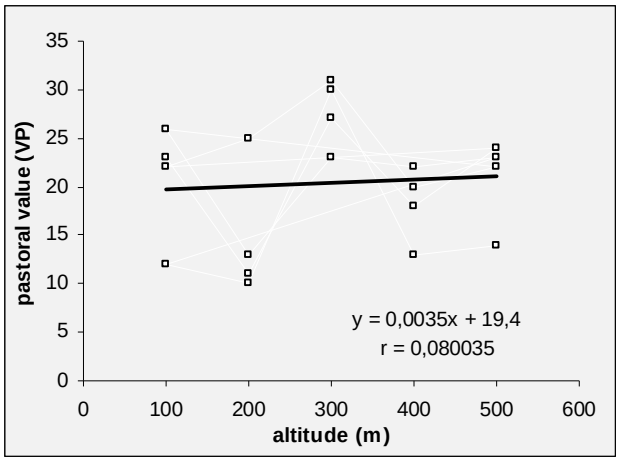


Figure 2: Correlation between altitude and pastoral value

As is shown in the graph, between the 100-500m altitudinal level and the pastoral value isn't any correlation, the coefficient obtained being 0.08.

CONCLUSIONS

After the analysis of the data obtained regarding the influence of the altitude on the pastoral value we can conclude that the values of this index are heterogeneous, these not being influenced on the 100-500m altitudinal interval. The low VP values calculated can be explained by the important presence of the species from other botanical families, respectively those without forager value at all altitudinal levels analysed. Thus, the pastoral value has values situated in a short interval, independent by altitude.

One of the reasons for the low pastoral values registered is the free grazing that is leading to the selective grazing of the good fodder species. Another negative aspect is the absence of the maintenance works as cleaning cuts after the grazing cycles for the reducing of the replacing of the species with high specific index with those without forager value.

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