ECOLOGICAL FUNCTIONS OF VEGETATION AS POTENTIAL OF ECOSYSTEM SERVICES (EXAMPLE OF ALDER FLOODPLAIN FOREST IN MICROREGION TRÍBEČSKO)

Slovak University of Agriculture in Nitra, Department of Ecology prof. RNDr. Pavol Eliáš, CSc. Ing. Patrícia Mariničová

Introduction

Ecological functions of vegetation

- They are considered in systems of ecological relationships
- they are important for the existence of natural ecosystems.

Main ecological function of an ecosystem is **productional function**: natural products, that are benefits for man and used by human (forage, melliferous, therapeutic potential).

Introduction

Potential

Maximum capacity of an ecosystem to provide ecosystem services.

Inductive approach

In this study we applied inductive approach (bottom-up) to identifying, mapping and valuating of ecosystem services **based on biodiversity**.

The Aim of the study

- Identification and evaluation of ecological functions of vegetation by inductive approach.
- Quantifying of some ecological functions of vegetation as potential to provide ecosystem services

The Aim of the study

A black riparian alder forest in Tríbeč Mts. was selected as an example of using of the inductive approach to estimate ecosystem services

• Study area



- Characteristic of sample plot
- Riparian alder forest
- Aegopodio-Alnetum glutinosae association V.
 Karpáti & I. Karpáti & Jurko ex Šomšák 1961
- referred as *Stellario nemorum-Alnetum glutinose* Lohmeyer 1957
- Phytocenological relevé was recorded by P. Eliáš, (2015)



- Ecological functions of vegetation
- (herbaceous species layer)
- Jurko (1990): methods of ecological and socio-economic evaluation
- Productional potential
- Forage potential
- Melliferous potential
- Therapeutic potential

- Productional potential
- Herb layer, Litter mass
- harvest method by direct sampling
- size of sample plot 1 x 1 m, divided into 0.5 x 0.5 m





Forage potential

Forage potential (P_f) was calculated from phytocenological relevé as sum of positive percentage values minus percentage of negative values (Jurko, 1990).

Table 1 Forage potential

Value	Pf		
-2. inadequate	< -20%		
-1. ineligible	-20 % to -2 %		
0. zero	-2 % to 2 %		
1. extremely low	2 % to 10 %		
2. very low	10 % to 20 %		
3. low	20 % to 40 %		
4. Medium	40 % to 60 %		
5. high	60 % to 75 %		
6. very high	75 % to 90 %		
7. extremely high	> 90 %		

Melliferous potential

The melliferous potential (P_m) was determined by quantitative significance of species (Jurko, 1990) from phytocenological relevé its categories for every vegetation layer separately.

Table 2 Melliferous potential

Value	Pm		
1. very low	< 20 %		
2. low	20 % - 50 %		
3. medium	50 % – 150 %		
4. high	150 %- 225 %		
5. very high	225 % – 275 %		
6. extremely high	> 275 %		

Therapeutic potential

The total therapeutic potential (P_t) was calculated by quantitative method as percentage rate of medicinal plants in phytocoenosis (Jurko, 1990).

Table 3 Therapeutic potential

Value	Pt
1. negligible	< 1 %
2. very poor	1 % – 5 %
3. poor	5 %– 10 %
4. little rich	10 % – 20 %
5. rich	20 % - 30 %
6. extremely rich	> 30 %

Productional potential – Herb layer

The seasonal maximum standing crop in *Aegopodio-Alnetum glutinosae* 59.03 g.m⁻².



Picture 1 Composition of species biomass in sample plot in Aegopodio -Alnetum glutinosae community

• Productional potential – Litter mas

The seasonal maximum of litter mass was 619.30 g.m⁻².



Picture 2 Composition of total litter mass in sample plot in Aegopodio -Alnetum glutinosae community

Productional potential – Herb layer/Litter mass

Data is clearly showed that the production of litter was more than 10 times higher as compared to herb layer. But woody litter mass was included!



Picture 3 Comapration of production of herbaceous layer and litter mass in [g.m⁻²] in sample plot *Aegopodio -Alnetum glutinosae* community

Ecological functions of vegetation

Table 4 Estimation /Evaluation of Forage (P_f), Melliferous (P_m) and Therapeutic (P_t) potential and eco-values of investigated species

Forest community	P _f	P _m	P _t
Aegopodio-Alnetum			
glutinosae	52.5 %	186.9 %	32.5 %

(P_f) – medium (4. class)
(P_m) – high (4. class)
(P_t) - extremely rich (6. class)

Conclusion

- 1. In the forest community *Aegopodio -Alnetum glutinosae* **40 plant species** were documented by phytocenological relevé.
- 2. The seasonal maximum standing crop of the herb layer was **59.03 g.m⁻²** (dry mass), compared with above-ground biomass of another forest communities, it is the most productive forest community.
- 3. Production of litter mass is **619.30 g.m⁻²**, the most part of litter is represented by woody litter (59 %).

Conclusion

Valuation of potentials of ecosystem services based on ecological functions of vegetation showed that the community *Aegopodio -Alnetum glutinosae* provides

- medium forage quality for herbivores (52.5 %),
- high melliferous potential (186.9 %) and
- extremely rich for medicinal plants (32.5 %).

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Thank you for your attention...