Traditional grassland management in the Eastern Carpathians (Romania)

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Extensive - traditional grassland management - mountain hay-meadows

- Labour-intensive land-use system
- Small-scale, typical low input farming
- Elaborated practices on hay meadows
- Maintain high biodiversity (plants, birds, insects - Orthoptera, Lepidoptera)
- Low average income
- Intensification and abandonment
Gyimes in the Eastern-Carpathians (Romania)
Grassland-dominated cultural landscape

- Csángó ethnic group, Hungarian mother tongue;
- 14,000 inhabitants (3 settlements);
- Special culture with lots of archaic elements (dance, folk music, religion etc.)
- 90% of the population works in the agricultural sector

The proportion of the grasslands and forests

<table>
<thead>
<tr>
<th>Year</th>
<th>Grasslands (%)</th>
<th>Forest (%)</th>
<th>Arable fields (%)</th>
<th>Hay meadows (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1792</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1870</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1890</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1940</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Traditional ethnobotanical knowledge in Gyimes

Knowledge on plant species
• 641 species in the local flora;
• 309 plant species; 207 folk taxa;
• Specialists: 90%; Average knowledge: 75-80%!

Knowledge on habitats
• 146 different habitat-types;
• Multidimensional habitat-partition (9 features, e.g. land use, vegetation structure, geomorphology)
• Gradients

Knowledge on processes
• Deep knowledge of succession after clear-cutting
• Knowledge of vegetation dynamics in grassland management to reduce the impact of disturbances


# Habitats and vegetation of the landscape

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>6230</td>
<td>Species-rich <em>Nardus</em> grasslands</td>
</tr>
<tr>
<td>6430</td>
<td>Hydrophilous tall herb fringe communities</td>
</tr>
<tr>
<td>6520</td>
<td>Mountain hay meadows</td>
</tr>
<tr>
<td>7230</td>
<td>Alkaline fens</td>
</tr>
</tbody>
</table>

- *Trisetetum flavescentis*
- *Arrhenatheretum elatioris*
- *Festuco rubrae-Agrostetum capillaris*
- *Violo declinatae-Nardetum*
## Types of mountain hay meadows in the Gyimes region

<table>
<thead>
<tr>
<th></th>
<th>Nearby hay meadows</th>
<th>Distant hay meadows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manuring</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Starting date of mowing</td>
<td>24th of June (Saint John’s day)</td>
<td>6th of August</td>
</tr>
<tr>
<td>Number of mowing</td>
<td>2(3)</td>
<td>1</td>
</tr>
<tr>
<td>Quality / quantity of the hay</td>
<td>Worse / more</td>
<td>Better / less</td>
</tr>
<tr>
<td>Characteristic species</td>
<td><em>Arrhenatherum elatius</em>, <em>Tragopogon pratensis</em>, <em>Salvia pratensis</em>, <em>Colchicum autumnale</em></td>
<td><em>Festuca rubra</em>, <em>Veratrum album</em>, <em>Helleborus purpurascens</em>, <em>Trifolium alpestre</em>, <em>Vaccinium vitis-idaeus</em></td>
</tr>
</tbody>
</table>
Traditional grassland management in Gyimes

- Mowing by scythe or single-axle motorized mower (technique and timing)
- Parcel rotation
- Manuring
- Oversowing with hayseed
- Oversowing with *Onobrychis viciifolia*
- Selective weeding certain (mainly poisonous) plant species
- To suppress some shrub species (e.g. *Spiraea chamaedryfolia*)
- Cleaning on hay meadows in spring
- Drainage spring fens
- To suppress moss patches
Management of mountain hay meadows

Parcel-rotation

- Unique step in the local meadow-management.
- Four to six meadow tracts in different parts of the valley (with variable exposure, altitude and inclination).
- Locals mow tracts in different order in every year.
- Early mowing: high quality hay (inhibits seed maturation)
- Late mowing: seed ripening and dispersal (hay quality is lower).
- Rotation guarantees the production of high quality fresh hay and production of grass seed: ensuring sufficient hay yield on the long run.
Management of mountain hay meadows

Hay meadows

Hay making

Hay storing

Feeding animals

Broken parts of plants + seeds + dust

Scattering of hayseed

Hayseed full with viable seeds

Storage of hayseed in barrels or in bags

Collecting hayseed
Management of mountain hay meadows

Application of hayseed

Scattering hayseed on hay meadows is necessary:

- To close gaps in the vegetation cover caused by trampling, extreme drought, dry frost, place of mole hills, ant hills facilitate regeneration

- Revegetation of abandoned arable fields

- 0.5 litre hayseed - 6,000 viable seed, 58 species in average in one sample (0.5 l), altogether 151 species!
Management of mountain hay meadows

Selective weeding of poisonous plant species

• Poisonous / tall, hardy species / plants lending unpleasant taste to hay
• Sprout well before grass species – easy to cut with a scythe
• *Pteridium aquilinum*: empty niche, reduces the quality of the hay
• *Colchicum autumnale, Veratrum album, Helleborus purpurascens*: strongly poisonous plant species.
Year-round on the nearby hay meadows:

1. Manuring
2. Oversowing with hayseed
3. Cleaning
4. (Grazing in spring)
5. Mowing
6. Mowing of aftermath
7. Grazing

XII. I. II. III. IV. V. VI. VII. VIII. IX. X. XI.
Year-round on the distant hay meadows

1. Cleaning
2. Selective weeding of poisonous plant species
3. Mowing
4. Grazing in autumn

2. Selective weeding of poisonous plant species
Conclusions

• Csángó farmers have an elaborated grassland-management system, based on deep ecological knowledge on natural environment.

• There are some practices, which can significantly influence the species-composition of the grasslands.

• One of the most important practice is application of the hayseed. Csángó people consciously apply it in revegetation, they are aware of the role of viable seeds in grassland revegetation.

• Hayseed could play an important role in nature conservation as well.

• We hope, that our results can contribute to improve the efficiency of agri-environmental schemes.

• Extensive grassland-management can enhance, than maintain high biodiversity.
