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STUDIES ON THE VITALITY AND THE STATE OF HEALTH OF CHARACTERISTIC SPECIES OF TREES FROM THE FOREST HABITATS FOUND IN THE PROTECTED AREA ROSCI 0128 (THE NORTHERN AREA OF EASTERN GORJ COUNTY)

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Abstract

The thematic area provided in this paper is situated in the protected area ROSCI 0128 (Northern area of Eastern Gorj county), occupying the southern part of Parang Mountains and the west part of the Capatanii Mountains. In the researched area there are the following Natura 2000 habitats: 9410 - Acidophilous Picea forests of the montane to alpine levels (Vaccinio piceetea), 91E0-Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae), 91V0 –Dacian Beech forests (Symphyto Fagion), 9110 - Luzulo-Fagetum beech forests, 9130 - Asperulo-Fagetum beech forests, 9170 - Galio-Carpinetum oak-hornbeam forests, 91Y0 - Dacian oak-hornbeam forests, 91Q0 - Western Carpathian calcicolous Pinus sylvestris forests, 9260 - Castanea sativa woods, 9150 - Medio-European limestone beech forests of the Cephalanthero-Fagion, 91L0 - Illyrian oakhornbeam forests (Erythronio-Carpinion). The stability of the forest is determined, in addition to the physiognomy, the composition of the flora, its stage of development, density, structure, and constituent species and especially the vitality of the characteristic species. Forest habitats from the thematic area have a vitality or state of vegetation from normal to low. The health of the trees or plant health is determined by the health and vitality of trees that make up the forest and is expressed by the degree of defoliation of trees or discoloration of the foliage, phenomena of damage or drying trees, tears, windfalls, established by biomonitoring forest ecosystems.*

Key words*: forest habitat, vitality, the state of health, protected area.*

INTRODUCTION

The territory under research is in the protected area ROSCI 0128 (Northern area of Eastern Gorj county), occupying the southern part of Parang Mountains and the west part of the Capatanii Mountains.

The state of health of the trees or the phyto-sanitary state is determined by the health and vitality of the trees that make up the tree stand and it is expressed by the degree of defoliation of the trees or the discoloration of the foliage, tree injury or drying phenomena, breaks, knocks, established through biomonitoring of forest ecosystems.

The stability of a tree is determined, in addition to the physiognomy, the floristic composition, its stage of development, its density, its structure, and the vitality of the component species and especially of the edifying species.

The vitality or vegetation refers to the growth vigor and the weather resistance of a tree stand. Thus, the planning rules in Romania classify vitality in the following categories:

- tree stands with a very active (vigorous) vegetation state when the trees have in recent years increased in diameter and height very much in relation to the age and reliability of the station;
- tree stands with active (vigorous) vegetation, when the last annual increases in diameter and height exceed the normal ones;
- tree stands with a normal vegetation state where the last increases in diameter and height are average in relation to the age and the reliability of the station;
- trees with weak vegetation, when the latest increases in diameter and height are subnormal (lower than average);
- tree stands with a very weak (feeble) vegetation, when the last increases in diameter and height are virtually null.

The analysis of the stands, in the North East Gorj protected area has led to the following results: the stands have a **normal vitality or vegetation state - N**, having the latest increases in diameter and height at middle level in relation to the age and the reliability of the station and **weak vitality or vegetation state**,

when the last increases in diameter and height are subnormal (lower than average).

MATERIALS AND METHODS

The field research on the field was carried out between 2014-2017, during all seasons and having clearly defined itineraries. The research underpinned solid bibliographical documentation with respect to the physical and geographical environment: the relief, geology-lithology, types of rocks, hydrographic net, soils and the general and local climate. The findings included forest habitats was closely analyzed, especially taking into consideration the anthropic factor.

RESULTS AND DISCUSSIONS

Studies on each type of forest habitat according to the health status of edifying tree species

The state of health of the trees or the phytosanitary state is determined by the health and vitality of trees that make up the tree stand and is expressed by the degree of defoliation of the trees or the discoloration of the foliage, phenomena of injury or drying of trees, breaks, knocks, established by the biomonitoring of forest ecosystems.

1.9410 habitat - Acidophilic mountain forests with *Picea abies* (Vaccinio-Piceetea)

Edifying species: *Picea abies*

Analyzing the phytocoenoses in the 9410 habitat was found to be characterized by: weak drying, isolated breaks, isolated break downs, weak hunting.

Within this habitat, the most important injuries are those caused by wind or snow break downs.

Figure 1. Isolated drying of lime spruce (photo M. Niculescu)

Figure 2. Isolated spruce break downs from the 2014 flood (photo M. Niculescu)

Figure 3. Wind break downs of the spruce (photo M. Niculescu)

Figure 4. Wind break downs of the spruce (photo M. Niculescu)

2. 91E0* habitat - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)

Edifying species: *Alnus glutinosa, A. incana, Salix alba, S. fragilis*

Analyzing the phytocoenoses within the 91E0* habitat it was found to be characterized by: break downs following the 2014 floods, isolated break downs, weak hunting.

Figure 5. Alder break downs
(photo M. Niculescu)

Figure 6. Alder break downs
(photo M. Niculescu)

3. 91V0 habitat - Dacian beech forests (*Symphyto-Fagion*)
Edifying species: *Abies alba, Fagus sylvatica, Acer pseudoplatanus*
Analyzing the phytocoenoses in the 91V0 habitat, it was found that they are characterized by: weak drying, isolated breaks, isolated break downs, weak hunting. The wind break downs were isolated in the *Abies alba* species. At *Fagus sylvatica* there were also encountered isolated attacks involving the the decay of the clover in the deciduous trees (*Phellinus igniarius* Quel.*),* the cancer of the deciduous species (*Nectria galligena* Bres.*),* the bacterial cancer of the deciduous species (*Psudomonas syringae*), *Cryptococcus fagisuga, Xyleborus saxeseni, Trypodendron domesticum, Cerambycidae, Hylecoetus dermestoides, Taphrorynchus bicolor, Xyleborus monographus, Lymantria monacha*.
4. 9110 habitat - *Luzulo-Fagetum* beech forests
Edifying species: *Fagus sylvatica*
Analyzing the phytocoenoses within the 9110 habitat, it was found that they are characterized by: weak drying, isolated breaks, isolated break downs, weak hunting. Isolated attacks have also occurred, which cause: the decay of the clover in the deciduous trees (*Phellinus igniarius* Quel.*)*, the cancer of the deciduous species (*Nectria galligena* Bres.) the bacterial cancer of the deciduous species (*Psudomonas syringae*), *Cryptococcus fagisuga, Xyleborus saxeseni, Trypodendron domesticum, Cerambycidae, Hylecoetus dermestoides, Taphrorynchus bicolor, Xyleborus monographus, Lymantria monacha*.

Figure 7. Isolated beech drying in 91V0 habitat
(photo M. Niculescu)

Figure 8. Weak drying of beech trees
(photo M. Niculescu) (rotting of the clover of deciduous trees (*Phellinus igniarius* Quel.)

Figure 9. Isolated break downs in beech
in 9110 habitat (photo M. Niculescu)

5. 9130 habitat - *Asperulo-Fagetum* beech forests Edifying species: *Carpinus betulus, Fagus sylvatica*
Analyzing the phytocoenoses in the 9130 habitat it was found to be characterized by: weak drying, isolated breaks, weak hunting.
In the beech and hornbeam, there have also been isolated attacks that produce: the decay of clover in the deciduous trees (*Phellinus igniarius* Quel.), the cancer of the deciduous species (*Nectria galligena* Bres.) the bacterial cancer of the deciduous species (*Psudomonas syringae*), *Cryptococcus fagisuga*, *Xyleborus saxes*, *Trypodendron domesticum*, *Cerambycidae*.

Figure 10. Breaks to beech trees (photo M. Niculescu)

6. 9170 - Galio-Carpinetum oak-hornbeam forests
Edifying species: *Carpinus betulus, Quercus petraea*
Analyzing the phytocoenoses within the 9170 habitat it was found to be characterized by: weak drying, isolated breaks. In the hornbeam, there have been encountered isolated attacks that produce: the decay of clover in the deciduous trees (*Phellinus igniarius* Quel.), the cancer of the deciduous species (*Nectria galligena* Bres.) the bacterial cancer of the deciduous species (*Psudomonas syringae*). In holm - *Cerambycidae*

Figure 11. Phytopathogenic attack on the habitat 91Y0 tree stand (photo M. Niculescu)

7. 91Y0 habitat - Dacian oak-hornbeam forests
Edifying species: *Carpinus betulus, Fagus sylvatica, Quercus robur, Quercus petraea*
Analyzing the phytocoenoses in the 91Y0 habitat it was found to be characterized by: weak drying, isolated breaks, isolated break downs, weak hunting.
Isolated attacks occurred that produce: Defoliator pests of the oak: oak hairy caterpillar (*Limantria dispar* L.), green oak moth (*Tortrix viridana* L.), *Laspeyresia splendana* Hb., *Archips rosana* L., *Eudemis profundana* F, the brown grasshopper (*Erannis defoliaria* Cl.), green grasshopper (*Operophtera brumata* L.), *Erannis aurantiaria* Hb.
Among the specific xylophagous pests of our forests and which are dominant in the complex structure of this category of pests, we can mention species such as Buprestide with two points (*Agrilus biguttatus* F.), *Agrilus viridis* L., the great oak crown (*Cerambyx cerdo* L.), painted oak crown (*Plagionotus detritus* L.), oak bark beetle (*Scolitus intricatus* Ratz).
The most widespread forest diseases are oak firing (*Microsphaera alphitoides* Griff. Et Maubl.), *Armillaria mellea* (Vahl: Fr.) the decay of clover in the deciduous trees (*Phellinus igniarius* Quel.), the cancer of the deciduous species (*Nectria galligena* Bres.) the bacterial cancer of the deciduous species (*Psudomonas syringae*) and *Taphrinia carpini* Rostr.

Figure 12. Break at *Quercus* petraea (photo M. Niculescu)

Figure 13. Rest of *Lucanus cervus* exoskeleton, attack in 91Y0 (photo M. Niculescu)

8. 91Q0 habitat- *Pinus sylvestris* relict forests on limestone
Edifying species: *Pinus sylvestris*
Analyzing the phytocoenoses of *Pinus sylvestris*, within the 91Q0 habitat, it was found that they are characterized by: weak drying, isolated breaks, weak hunting.
9. 9260 habitat - Edible chestnut forests (*Castanea sativa*) [*Castanea sativa* Woods]
Edifying species: *Castanea sativa*
Isolate there has been observed attack of: *Cryptonecria parasitica, Phytophtora cynnamoni* and *P. cambivora*, weak drying, isolated breaks.
10. 9150 habitat - Medio-European limestone beech forests of the *Cephalanthero-Fagion*
Edifying species: *Carpinus betulus, Fagus sylvatica*
Analyzing the phytocoenoses within the 9150 habitat it was found to be characterized by: weak drying, weak injury.
Isolated it has been observed attack of: the the decay of clover in the deciduous trees (*Phellinus igniarius* Quel.), the cancer of the deciduous species (*Nectria galligena* Bres.) the bacterial cancer of the deciduous species (*Psudomonas syringae*).
11. 91L0 habitat - Illyrian oak-hornbeam forests (*Erythronio-Carpiniori*)
Ass. Asperulo taurinae-Carpinetum Soó et Borhidi in Soó, 1962.
Edifying species: *Carpinus betulus*
Analyzing the phytocoenoses in the 91L0 habitat it was found to be characterized by: weak drying, weak injury.
In the hornbeam, there have also been isolated attacks that produce: the decay of clover in the deciduous trees (*Phellinus igniarius* Quel.), the cancer of the deciduous species (*Nectria galligena* Bres.) the bacterial cancer of the deciduous species (*Psudomonas syringae*), Cerambycidae.

Research on the distribution of forest types of treatment applied and applicable to each forest habitat

In a tree stand, an essential condition is to apply the treatments properly, especially when it comes to a protected area.
At the age of exploitation, determined by forest planning studies, the mature tree stand is harvested to create the conditions required for the installation and development of a new generation of trees. The special way in which the mature trees are harvested and the way how the regeneration of the tree stands is ensured under the same regime for the purpose of achieving household purposes is called treatment.
The main source of data on the cutting of main products or secondary products is the arrangement, whose field and office work is carried out by specialized bodies, by administrative territorial units: forest districts, associations of owners, councils, communes, simple forest owners or silo-hunting sections.
In the case of the treatment there are differrences of the periodic surface in time, the period of regeneration or rotation, in the case of trees treated in gardening, the special regeneration period, being differentiated according to the objectives set for the choice and application of the treatments. The choice of treatment takes into account the biological characteristics of the species, the static conditions, ecological and economic considerations. At the same time, it is necessary to consider whether the tree stands are located in a protected area or National Park. if In relation to these elements, are established: the duration of the regeneration process, the number, the frequency and the intensity of the interventions, the epochs and the deadlines for the execution of the exploitation works.
In the protected area North East Gorj, the following types of applied and applicable forest treatments are met: conservation cuts, helping natural regeneration, hygiene cuts, progressive cuts, cleansing, clearance, cuttings, cuttings in the groves, additions, cuts.
In addition to the above-mentioned works, which are considered to be forest treatments, in the protected North East Gorj area, the

following types of treatments are also provided according to the planning regulations:

- ***Type II (T_{II}):*** forests with special protective functions located on environmentally-friendly stations, as well as the forest stands where it is not possible to harvest wood, requiring only ***special preservation*** works;
- ***Type III (T_{III}):*** forests with special protection functions for which only intensive treatments are allowed - gardening, quasi-gardening.
- ***Type IV (T_{IV}):*** forests with special protection functions for which, in addition to gardening, quasi-gardening are admitted other treatments subject to special restrictions on application;

They apply equally to all the forest habitats in the area, respecting the planning regulations.

CONCLUSIONS

The stability of the forest is determined, in addition to the physiognomy, the composition of the flora, its stage of development, density, structure, and constituent species and especially the vitality of the characteristic species. Forest habitats from the thematic area have a vitality or state of vegetation from normal to low. The health of the trees or plant health is determined by the health and vitality of trees that make up the forest and is expressed by the degree of defoliation of trees or discoloration of the foliage, phenomena of damage or drying trees, tears, windfalls, established by biomonitoring forest ecosystems. In the protected area North East Gorj, the following types of applied and applicable forest treatments are met: conservation cuts, helping natural regeneration, hygiene cuts, progressive cuts, cleansing, clearance, cuttings, cuttings in the groves, additions, cuts.

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