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STUDY OF ECOLOGICAL INTERACTIONS IN THE FOREST ENVIRONMENT

BY

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Abstract. This paper treats the problem of interactions in the forest environment and their effects. The composition, structure and functions of the forest at one point are conditioned by changes in the environmental context over time, but its internal environment, its protective function is determined precisely by the structure and state of the forest at each stage of its evolution. Forest vegetation has a high capacity to oppose random variations of environmental factors, even when they exceed the boundaries of their tolerance zone.

Keywords: environment; forest; ecosystems; vegetation; climate changes.

1. Introduction

From an ecological perspective, living organisms are constituted in populations that interact with each other, conditioning each other's existence, state and functionality, but are in the same complex interactions with the a-biotic environment in the space occupied by the living community (biocenosis).

At the same time, the forest system formed - the forest as a whole - influences and it is influenced by other neighboring ecosystems, integrated at a higher level - forest biomes (extensive forests of different types, covering a

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landscape). Over these complex interactions in which the forest is engaged overlap with the social-human environment, consisting predominantly of the forest-technical actions, but also of other antrophic factors, which derive from other human actions and is redistributed above the forest, conditioning its existence, the condition, its functionality.

The specific environment of the forest, resulting from complex interactions between living organisms as biochemical and biochemical factors and the abiogenic environment or the forest resort (biotope - habitat), including the cosmic, geographic, orographic, edaphic, hydrological, geochemical environment) has the character of a global ecological result - which configures the conjuncture environment (soil, climate, etc.) specific to the forest at one point.

The resulting forest environment is of a conjectural nature because many ecological factors vary in their random concentration and, due to the complex interaction between them, changing the concentration of one alone leads to the change of all and the resultant - the forest environment.

Initial, the character of the environment is dominated by the abiogenic environments – litho-logy, orography, soil, climate of the site or biotope, but after the forest closes and the stabilization of its biocenosis, its environment is predominantly determined by biochemical and biochemical factors.

So, anthropogenic factors - which act directly on the forest (forests measures, sports hunting and poaching, grazing domestic animals) and indirectly (chemical pollutants from agriculture, industries, transport, radioactive isotopes and their energies) can strongly disturb the forest environment due to interactions complex with both the living world and inorganic environments.

Permanent exchanges of substance, energy and information between living components and between them and the abiogenic environment, which have extremely intense and directs over the long existence of the forest, have allowed for the establishment of a biochemical balance (balanced numerical ratios among populations) of an ecological balance (between them and their surrounding environment).

In a complex and diversified structured forest, these fluctuations do not affect the integrity and apparent stability, the almost continuously interrupted equilibrium is quickly restored not to its predecessor parameters, but to another level, often higher, thanks to feed-back circuits.

In the relationships between forest-living animals (plant and animal species) represented by populations with a variable population, with a generation structure and age that changes over time and factors of their external environment, each ecological factor has a specific action, even when has the same strength.

There is an optimal level of concentration of all ecological factors at which each species reaches its maximum diversification and development, a level that is not usually achieved, the coincidence of the optimum concentration of all ecological factors with a low probability.

2. Experimental

In the existence of the forest, in its evolution, the relationships between the abiotic factors and the vegetation are decisive; consequently, their knowledge, the general and the particular aspects are of particular importance, both for the correct execution of the forests measures and for the design of a new forest or for the ecological reconstruction of the destroyed ones.

The existence of different plant species, their flocks, the degree of individual development, the structure of the plant populations depend on the whole abiotic factors and not on the concentration and the action of each of them, as well as on their variation regime over time, namely the succession of the ecological conjunctions static - for long periods of time, yearly, seasonally, monthly.

On the other hand, phenology, typology and phenomenology of forest vegetation are expressions of adaptation of plants not to the variations of each ecological factor, but to these ecological conjunctions that have succeeded over time.

So, when analyzing a resort for forests purposes, it must be described in terms of all ecological factors and the interaction between them, with their entire variation regime (in the past, today, predictable).

At the same time, vegetation is analyzed and if a certain degradation state (more or less advanced) is found, then a static cause should not be sought, but a set of causes that led, through interaction, to this result and more rarely the factor minimal that caused the collapse, exclusion of a species or more species, even when the other factors were if not optimal, at least tolerable.

Forest vegetation has a high capacity to oppose random variations of environmental factors, even when they exceed the boundaries of their tolerance zone, if these variations are often repeated in the existence of the forest, each time having similar intensities, meanings and durations.

On the other hand, the abiogenic environment of the resort with a certain geographical position, altitude, relief, soil, etc., is strongly modified by the vegetation of the forest, its structure, the nature and development of the forest, but also the other levels in which in essence, the climate is changed.

Consequently, we can speak, taking on the ecological factors, their specific influence on the plants, the animals, the life of the forest, but also the influence of the life of forests, animals, plants on the abiotic ecological factors.

3. Results and Discussions

Regarding the interactions between climate and the forest life, vegetation receives and modifies all the climate factors (heat, light, humidity, wind), resulting in a particular climate - forest fito-climate, differentiated as a microclimate from the one above or around the forest.

This, in turn, changes the soil climate and influences the life, not only of the plants themselves, but also of the animals.

In the interaction between light and heat, the solar radiant energy,

composed of light and heat radiation, emitted as a constant (1.98 cal / cm^2 / min) is retained in a proportion of approx. 53% of the earth's atmosphere by retreating and retaining, with only 47% reaching the ground when it is discovered or at the surface of the forest's crown.

The upper part of the forest canopy behaves like a screen in the way of cosmic radiation, in general, and solar radiation, in particular.

Thus, it reflects in the atmosphere about. 20-25% of this radiation (albedo) absorbs 35-70% of it and only 5-40% penetrates the forest. The forest soil reaches only 0.01 cal / cm^2 / min of the entire solar constant, while on the ground discovered the intensity of the solar radiation reaches 1.5 cal / cm^2 / min.

The intensity of solar radiation is unevenly distributed in space and time, due to the shape and the movement of the plant, depending on: latitude, longitude (geographical position), altitude, local orography (relief), obtaining a regional and zonal character with values that give macroclimate more extensive territories (geographical areas, geographical regions, etc.). At the local level, the shape of the slopes, the size of the slopes and their orientation, and shading are determinants of the degree of sunstroke.

Ultraviolet radiation has a lower weight in terrestrial light, and they are retained in the ozone layer, and infrared, with very high calorific power, are partially retained by water vapor from the earth's atmosphere as well as carbon dioxide, so that the entire spectrum the solar radiation from the ground and its covering vegetation is weighted by the characteristics and the state of the atmosphere in a life-saving direction, with all its forms of manifestation.

Nebulosity (cloud cover with clouds, cloud type, and ceiling height position determines the intensity of light at different latitudes.

Through photosynthesis, all the luminous energy is brought to the same denominator as the geochemical - and under this form (of chemical energy) it is then circulated on the flow of the substance in the body of each plant through trophic chains into the body of all animals, contributing to all the transformations of the substances from an ecosystem and the entire biosphere.

All transformations have resulted in a great diversity of living organic substances and plant and animal products and a wide variety of forms of energy (metabolic energy, movement, locomotion, nervousness) as well as rhythms of activity (life), of production.

The light budget inside the forest is diminished compared to the one reached at the top of the canopy with the value of the albedo (% of the light received, which is reflected in the atmosphere).

The average values of the luminous albedo are 20-25%, but its variation limits are much higher, depending on the characteristics of the stands, their massiveness and density, the closure mode and profile shape, the crown leaf characteristics, the size, position, color, condition of their surface.

Obviously, the intensity of light inside the forest decreases gradually or sharply from upper to lower floors, in any forest, more or less, depending on the nature of the trees.

For example, in an oak tree, with a lower albedo, with wider crowns,

with irregularly shaped leaves, having a more uneven layout, the amount of light absorbed will be lower and thus the budget and the light regime under the arbores will always be more favorable than in the beech one, allowing only 15% of the active photosynthetic radiation to pass through the canopy, absorbing 80% of the incident radiation in its photosynthetic device and 70% of the photosynthetic active.

4. Conclusions

Each climatic factor does not separately affect the individuals and the populations of the forest, but only in interaction with all the others.

For life and for forest, a big importance has the state of the atmosphere, not only directly, through the ecological functions of its gas (O_2, CO_2, N_2, etc.) but indirectly by its ability to modify the regime of the most important climatic factors - light and heat.

All transformations are conditioned by the rhythm of solar energy supply, especially bright, much more intense and directly into the plant world and less bland and indirect in the animal world, which has managed to gain some independence from the cosmic rhythms, through improving the respiratory system.

Consequently, the composition, structure, but above all the state and functionality of the forest, the life of the forest are conditioned by the distribution of light and its effects, in terms of illumination duration, intensity of light and quality.

The forest influences not only its own light budget, but, through its shadow stretching in different directions during the day, over a distance greater than the average height of its tree, tempered and modeled the budget and the light and heat regime of the perimeters around other ecosystems (meadows, agricultural ecosystems) or uncovered lands.

The tree influences the light regime of the lower vegetation floors by absorbing and retaining on average 35 to 70% of the incident light, and in some cases up to 98% of the full light.

The amount of light that the other floors receive depends not only on the direct one left by the tree, but also on the diffuse (50-75%) that either passes through the leaves (through refraction) or is reflected from the inner leaves of the canopy, not to the atmosphere, above the canopy, but to the ground or lower floors or the leaves below, on the same floor, at the bottom of the crown.

Forest species have generally known demands on the intensity of light, which, in the case of trees, refers to the values of the light intensity characteristic of the biotope, its geographic position, altitude, shape, relief, slope, exigencies that satisfy the installation and tree development.

Also, the plants in the lower floors have exigencies to this factor and a specific behavior to its variation, only if they are satisfied or not, causing them different modifications, not so much the budget and light regime of the place as

the structure and the face behavior the light of the fir tree (albedou, absorption, shading).

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STUDIUL INTERACȚIUNILOR ECOLOGICE ÎN MEDIUL SILVIC

(Rezumat)

Este tratată problema interacțiunilor ecologice din mediul silvic și efectele lor. Compoziția, structura și funcțiile pădurii la un moment dat sunt condiționate de schimbările conjuncturii de mediu în decursul timpului, dar mediul său intern, funcția sa protectoare sunt determinate tocmai de structura și starea pădurii în fiecare etapă a evoluției sale. Vegetația forestieră are o înaltă capacitate de a se opune variațiilor aleatorii ale factorilor ecologici, chiar și atunci când acestea depășesc limitele zonei lor de toleranță, dacă aceste variații se repetă des în existența pădurii, de fiecare dată având intensități, sensuri și durate asemănătoare.