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The seasonal dynamics of bacteriostatic character of oak forests

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Bacteriostatic character is the main indicator of evaluation of status of recreation forests and also perspectives for landscape therapy in balneology. The seasonal bacteriostatic character of natural forests of the especially guarded ecologico-seasonal region of the Russian Federation – Caucasian Mineral Waters, formed by sessile oak, was studied *(Quercus robur L. ex Liebl.)*. The age of the forest stand is 40. The wooden resource – 102 m^3/ha. The green mass of forest phytocenosis (absolutely dry weight), including forest stand, undergrowth and the grass cover: 5,325 t/ha. The height of growth above the sea-level: 500-550 m.

The bacteriostatic character of wooden phytocenoses was studied during vegetative period (May–September) by way of the influence of natural phytoorganic background of the ground layer of atmosphere under a tree canopy of forest for a test-culture Staphylococcus aureus-209. The bacteriostatic character was defined by % of oppression of the test-culture in comparison with a laboratorial control.

The bacteriostatic character of oak phytocenosis made in May and June of 25% of oppression S.aureus 209p (at average temperatures of air 18,5-22,6˚C and relative humidity of air of 64-70 %), in July has increased to 30% (at air temperature 24,3˚C and humidity of 45%). In August the bacteriostatic character of phytocenosis decreased 25% by the decrease of the air temperature to 21,9˚C and the increase of air humidity to 61%. In September the sharp decrease of the bacteriostatic character to 3% is viewed by the decrease of air temperature to 17,6˚C and the increase of the values of the relative air humidity to 79%. The difference in the bacteriostatic character of oak phytocenosis in May and July is substantial by 10% level of value, in July and September, and also in August and September – by 1%.

Together with that, the results of the previous research works have showed that in October, in comparison with September, the short-term but considerable increase antibacterial activity of growing yellow foliage connected with decomposition of structural substances in a cell, is viewed [1].

The empirical equation of regression of the bacteriostatic character of oak phytocenose during the vegetative period depending on the air temperature dynamics has been received:

$$Y=209,74 – 2,85X – 2648,26/X$$

Where Y–the bacteriostatic character of oak phytocenisis (% oppression S.aureus-209);

X– air temperature,^{0} [U+FFFD] The parameters of equation: correlation relationship η=0,85; error s=0,12;

reliability t=7,08>$t_{0,05}$=2,08.

The regression has a parabolic trend that agrees with the tolerance law of Shelford.

The received data allow to predict the bacteriostatic character of oak forests during the vegetative period, and also on-line depending on the dynamics of the air temperature.

References:

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