INFLUENCE OF GREEN PLANTS ON DISTRIBUTION OF SOLAR RADIATION UNDER CONDITIONS OF URBAN BUILDING

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The environmental function of vegetation provides a comfortable living conditions for people in the city. Green plantations affect the gas composition of air and the degree of its pollution, form the climatic characteristics of urban development, reduce the influence of the noise factor, have phytoncide properties, form a comfortable environment for human habitation.

The microclimate in the urban development significantly depends on the distribution of solar radiation fluxes. This is a complex task, which depends on many factors. The intensity of solar radiation for each area depends on its geographical location, geometric and other factors and is determined by special methods. In Ukraine, the share of diffuse (scattered) component of radiation is high and varies from 21% in summer to 60% in winter. In summer, the density of the heat flux of solar radiation in our latitudes reaches 1 kW / m2, which, as a rule, determines the microclimate parameters of streets and premises. Green plantations, especially trees, can significantly influence the distribution of solar radiation over the surfaces of urban buildings, structures and infrastructure objects.

It was developed a mathematical model which finds the distribution of heat fluxes of solar energy, depending on the characteristics of urban buildings, location and size of green spaces. With its help, the distribution of solar radiation on a 12 m wide street was investigated. On the street's sides there are buildings of 12 m height, which corresponds to the height of the five-story building. It was assumed that at a distance of 1.5 m from the left building there is a row of pyramidal trees 6 m high and 2 m wide. The height of the sun above the horizon and the azimuth angle between the direction of the road and the direction to the sun were 80o and 60o, respectively.

The results of the research show that in the shadow zones from tree crowns, the resulting heat flux is substantially lower than that of areas illuminated by direct sunlight. It was shown that the presence of a green zone on the street is capable of 10-20 times reduce heat flows to the surface of the road and the walls of buildings.

The results of the study can be used to determine the microclimate parameters within the street and inside buildings. It is also possible to assess the impact of green street plantations on energy costs for stabilizing microclimate parameters inside buildings in the summer. This will allow estimating the carbon monoxide emissions that are needed to generate energy for air conditioning of the premises.

Key words: Green Areas, Solar Radiation, Urban Development, Microclimate, Heat Flow, Mathematical Model