

*Экология и рациональное природопользование***Formation and Functioning of urban environmental complex in the European North**

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Biodiversity and state of flora and fauna, as well as diversity, state and properties of soils at the central (historical) part of Arkhangelsk city are studied. Lists of species of lichens, herbaceous and woody plants (according to their taxonomic belonging) are composed. It is revealed the significant (to 35-40 %) reduction of a species composition of lichens and herbs in comparison to background territories. The state of lichens in conditions of northern city ecosystems and possibility of its usage as a bio-indicator of technogenic pollution of air are analyzed. It is fixed that city gardening is based on predominant use of deciduous introduced species of shrubs and trees. The state of stands of a larch (*Larix sibirica* L.), as the most widespread among coniferous plants in the gardening of Arkhangelsk, was investigated with use of a complex morpho-biometrical, physiological and biochemical parameters.

The widespread, dominant and infrequent species of birds in the city of Arkhangelsk are revealed, their taxonomic list is composed. The influence of the age of building on maintenance of diversity level of plants was also established. Species diversity in the suburbs is higher due to the presence of half natural and ruderal ecotope. The species composition and the population structure of one of the most widespread insects – ground beetles (Coleoptera, Carabidae) – is investigated. It is fixed, that in comparison to coniferous forests, in suburban landscapes of the north (with domination of deciduous trees) the specific richness and catching of ground beetles are higher.

Physical-mechanical, agrochemical and microbiological properties of the basic types of city soils, providing their self-regeneration and autopurification in conditions of technogenic ecosystems, are investigated. The basic pollutants are revealed, their contents in soils of different types is analysed. Difference of city soils («culturozem», «urbanozem», «replantozem») from natural soils is shown. It is fixed, that the most of city soils, because of exuberant content of sand, incomplete decomposition of organic substances, significant littering of surface soil layers and layers-mixing, can not provide autopurification and promote the accumulation of pollutants. They appreciably provoke a soil runoff without neutralization of the technogenic pollutants.

Preliminary recommendations for conservation of a biodiversity, for enriching of environment of city ecosystem and its components are given. Contents of gross and active forms almost 20 of bioorganic elements and elements-pollutant in Archangelsk soil is determined, regularity of contents of chemical elements from soil type and their genesis' peculiarity.

The organization in the city the monitoring of soils as the basic parts of ecosystems is necessary. Such monitoring must provide not only observation of soils state from the point of view of their technogenic pollution, but also the control of their physical-mechanical and agrochemical properties causing the role of soils in the environmental-formation and environmental-purification.

It is also necessary:

- to make revision of technologies of building and reconstruction of grassplots, parks and avenues in the city;

- to increase the attention to selection of assortment of herbs, shrubs and trees used in city gardening, with the count of their bioecological features, stability to technogenic pollution and mechanisms of functioning in modified conditions of natural-technogenic complex of city ecosystems;

- to develop the program of conservation of a natural complex of cities in the north with the count of a state of environment, features of adaptations to it of ingredients of a nature (soils, plants and animals) and long-term plans of development of metropolitan agglomerations;

- to develop the complex program of ecological education of the population.

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**Энергетическая эффективность фрезерной обработки почвы под озимую пшеницу**

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При размещении после поздноубираемых предшественников – кукурузы на зерно, поживной кукурузы на силос – остаётся мало времени для качественной подготовки почвы и посева озимой пшеницы. Кроме того, обычными способами её проведения (вспашка + дискования тяжёлыми дисковыми боронами) невозможно добиться удовлетворительной разделки пласта. Для достижения этого прибегают к 3-5 кратным дискованиям, но желаемых результатов так и не достигают. Решение проблемы существенно облегчается в случае полного исключения вспашки из системы обработки почвы и замены её поверхностными обработками теми же дисковыми боронами или культиватором – фрезой КФ-300. Это позволяет сократить объёмы работ в зависимости от предшественника в 1,7-2,4 раза и энергетические затраты (в зависимости от предшественника и орудия обработки) в 1,7-4,0 раза.

Рациональное использование энергетических ресурсов определяется не только количественным их сокращением на обработку единицы площади. Важную роль при этом играет также объём продук-