«Research of cyanobacterial complexes in Krasnoyarsk in the context of creation of a complex of actions for ecological engineering»

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Problem statement

- The urban environment represents a set of factors which often negatively influence on both a biota in general and on human health in particular. Pollution by household garbage, consolidation of soil, a spill of fuel liquids, burning off high soil layers, regular excavation is characteristic of recreation areas (recreational zones) located within the city. In this regard the research of reaction of soil algal flora to recreational loading for assessment, the forecast of a condition of city agglomerations and creation of a complex of actions for ecological engineering is relevant.
Research methods

• Researches were conducted according to the practical standards of E A Shtina. Research methods of algae in the soil are distributed into three groups, according to stages:
  1) sample soil collection;
  2) soil algae species identification (qualitative research);
  3) quantitative algae record.

• Alongside with collecting soil tests air temperature and atmospheric precipitation data were registered.

• When identifying algae species different options of culture method were used: water cultures and cultures on glasses of growth. For water cultures Gromov's medium and Bristol medium in Gollerbakh's modification were used. At formulation of cultures of soil algae standard methods of microbiological technique were used.

• For identification of algae cytochemical reactions to amylum – by Lugol solution, on general mucilage outline– by 1% ink solution, on structural mucilage – by 0.1% solution of methylene blue were carried out.

• During identification of a systematic range of algal flora the morphological, reproductive and cultural features, specific for each population were analyzed.
Conclusions

Results, implementation

• Results of identification were fixed by original drawings and microphotographs and also complemented with descriptions of the characteristics of diagnostic value.

• Algal groups are presented in systematic list in the following order: Cyanophyta, Chlorophyta, Xanthophyta, Bacillariophyta.

• For all sample areas plant-sociological evaluation of herbal cover which included definition of the following indexes was carried out: total number of species of vascular plants, identification of the leading families, establishing of synanthropic species rate. Besides that projective coverage level (%), footpath structure and also biomorphological features of herbage were considered. In the selected samples granulometric size composition, density and humidity of soils were defined; calcareousness; gypsum bearing; pH water and salt extracts; exchangeable base status; carbon percentage; gross nitrogen content.
Conclusions

• On the basis of literary data and personal researches five categories of ground cover disturbance are marked:

• undisturbed – layer and soil aren't disturbed, the projective coverage of grass cover is more than 60%, ruderal species are absent, the footpath structure isn't expressed;

• weekly disturbed – in a layer and soil there are signs of disturbances, a projective coverage of a ground cover up to 40%, weed species are singly present in the composition of herbage, the area of footpaths doesn't exceed 10%;

• average disturbed – the layer isn't disturbed, the soil is firmed, weed species rate in the composition of herbage increases up to 10%, the projective coverage decreases up to 30%, the area of footpaths is 20-30%;

• badly disturbed– the layer is absent, the soil is firmed, for herbage signs of prairiefiction are specific, a projective coverage of a ground cover of 10-15%, ruderal species dominate, the area of footpath structure reaches 50-60%;

• degraded – are characterized by heavy density of soil and total absence of a layer and ground cover.
Conclusions

• The complex of the species sensitive to anthropogenic influences and the species-tolerants adapted to life under anthropogenic stress was identified.

• Change of the dominating complexes occurs with an increase in the degree of recreational load.

• Method of correlation pleiades using a ranged series of orders of soil algae allows to estimate most objective influence of various degree of recreational load on the taxonomic structure of algosinuziyas.
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