

# Lichens in the Urban Environment within South-East of Western Siberia, Russia

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## Abstract

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Lichen species diversity and trend of their distribution were studied in two big cities and five towns in south-east of Western Siberia. In total of 348 species from 46 families and 98 genera were found in all studied urban and suburban areas. All local checklists are characterized by high degree of the lichen species similarity between each other and smaller lists are included in bigger ones on to 64-100%. Epiphytic lichens were the largest group in all studied areas and almost half of them were occupied two and more substrates. Crustose life-form and mesophytes prevailed everywhere. Share of sensitive lichens exceeded percent of tolerant ones in big cities and was lower than tolerant ones in smaller towns. The sixteen species were the most tolerant, commonly present everywhere and have been recognized as the key species for urban lichen synusiae within south-east of Western Siberia. Five zones have been determined with IP-mapping (mapping on the base of index of air pollution tolerance) in studied areas: IP=3-5 is a "normal zone", IP=5-7 is a "moderate exposure zone", IP=7-9 is a "mixed zone", IP=9-10 is a "struggle zone", and finally – lichen-free zone. The most studied urban areas had got quite extensive lichen-free zone (up to 35% of their areas).

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## Introduction

The aim of this study was to reveal lichen species richness and trend of their distribution in urban areas with harsh continental mid-latitude climate. The lichens were studied in two big cities and five towns on the south-east of Western Siberia. This result is preliminary one and the research should be continued in the near future. At the beginning of this study, only a few literature data were available on lichens of the Barnaul (Skachko, 2003) and Novokuznetsk cities (Baumgartner, 1998). Only 21 and 23 lichen species have been reported from these cities, respectively. Additionally, only incomplete published data were available on lichens of the Novosibirsk city (Sedelnokova, 1997; Barsukov, 2001).

During 2000-2012, lichen species diversity and distribution were investigated in urban areas of the two large Siberian industrial centers:

Novosibirsk and Kemerovo, as well as in five smaller towns of Novosibirsk Region: Berdsk, Ob', Iskitim, Kol'tsovo, Krasnoobsk. The main characteristics of these areas are listed in Table 1. At the same time, similar studies were performed in Kuzbass cities: Mezhdurechensk and Osinnyki (Baumgartner, 2011, 2012). Unfortunately, there are too many inaccuracies and questionable data in some publications, and therefore, these data sources could not be fully relied upon.

Studied urban areas are located in south-east of Western Siberia (Russia) within forest-steppe zone and are characterized by harsh continental climate: with long, cold winter, but short, hot summer. The dominant native vegetation in the studied areas is birch and pine forests, birch forest outliers, willow and poplar wilds in river flood plains and grass formations. All studied cities and towns are planted with trees and shrubs quite