

## Summary

Air pollution is one of the biggest issues that humanity is facing today. Even if numerous attempts are made to reduce the emission of pollution, it is practically impossible to eliminate them completely. Considering the above, the search for new, cheap and easily accessible methods of air quality monitoring has become extremely important. However, before new methods come into use, it is important to make sure that the answer they give about air quality is trustworthy. This self-report consists of a series of thematically uniform publications, concerning, among others, the possibility to use spider webs and different methods in the air quality monitoring. The research was conducted in 2018-2021. Spider webs (mainly from the Agelenidae family), collected from laboratory reared spiders and then transplanted in the study area were used for this research, and supplementary webs directly from the field were taken. Lichens – species *Hypogymnia physodes* (L.), which were transplanted from the Stobrawa Landscape Park, were selected as the second bioindicator. In addition to the previously mentioned bioindicators, specialized equipment for active methods was also used for these studies, i.e. the DIGITEL DHA 80 high volume sampler and the HORIBA PX-375 sampler with the online metal analyzer. The main objective of this work was to verify whether information on air quality obtained from passive biomonitoring methods, for example, using spider webs is similar to the response from monitoring using active methods. Moreover, it was also important to directly compare the concentrations of metals received from the analyses of spider webs with those recorded for lichens. An additional part of the work was devoted to examining the possibility of using particles accumulated on the spider webs in the assessment of health risk. Apart from the short-term biomonitoring studies, annual air pollution monitoring was also carried out using various analyses, aimed at detailed characterization of air quality in the area close to the Legnica copper smelter. The research has shown that the chosen methods for air pollution monitoring (i. e. biomonitoring with the use of spider webs and lichens and active method) give similar responses in terms of the sources of air pollution. In addition, it was concluded that the accumulation of metals by spider webs was higher than that by lichens and, what is more, that the particles collected by spider webs can be successfully used for the assessment of health risk. Finally, it can be said that spider webs, as a cheap and easily accessible bioindicator, can be considered a useful tool in air quality biomonitoring.