

ABSTRACT

Condition and structure of the white mulberry (*Morus alba* L.) population in Wrocław

Introducing alien species into places outside their natural range is associated with a high risk, but in the face of climate change it turns out to be a necessity. It is reasonable to search for new species of ornamental and useful plants, resistant to drought, heat and pollution, which could replace native and previously cultivated alien trees and shrubs. In both cases white mulberry seems to be a suitable candidate for planting in south-western Poland. The main aim of the research was to characterize the current state and structure of the Wrocław population of this species, to determine the influencing factors and to forecast its future development. The additional aim was to select individuals with particularly favourable functional characteristics in terms of fruiting, useful in further breeding. The research was conducted in 2017-2020 in Wrocław. Detailed observations include 10 white mulberry locations, for which the phenological characteristics were developed against the background of thermal conditions in subsequent seasons as well as the morphological and biochemical analysis of the fruit, which was done by comparison of individual locations with each other. A relationship was found between the distribution and number of artificial mulberry plantings in Wrocław with the level of urbanization and the distribution of the Municipal Heat Island, and at the same time no analogous relationships were found in the frequency of spontaneous renewals of this species. A significant temporal differentiation of the phenological phases of white mulberry was observed both in subsequent years and between individual sites. The onset of maturation was highly and highly significantly correlated with the studied thermal coefficients. The studied mulberry sites were characterized by high variability in fruit weight, length and diameter, both between individual sites and in subsequent years, as well as a strong biochemical diversity of leaves and fruit. The content of elements in the soil did not affect the biochemical composition of the leaves or the size of the white mulberry fruit. Results of this research may constitute a baseline for further selection and breeding of female phenotypes having abundant fruiting and/or advantageous fruit quality characteristics suitable for cultivations in climate conditions of south-western Poland.