



Fossil carbon detection in urban vegetation by radiocarbon measurements at Debrecen city, Hungary

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Leaf samples of deciduous tree and grass are applicable to detect fossil carbon dioxide emission in the air during the vegetation period thanks to the plants collect the CO₂ from the air by the photosynthesis (Baydoun et al. 2015, Alessio et al. 2017, Park et al. 2013). In our study, 92 samples were collected at 39 sampling points in the downtown of the second largest city of Hungary, Debrecen. Grass samples were collected from the ground level and tree leaf samples from head height throughout the downtown. For the determination of fossil carbon ratio background samples were collected from the Great Forest, Debrecen, 4 km far from the downtown and 2 km far from the border of the city. The background environmental samples were also compared with atmospheric CO₂ measurements from a Hungarian regional background site, Hegyhátsál (Haszpra et al. 2005). According to the accelerator mass spectrometry measurements, there was detectable fossil CO₂ emission at almost every sampling site both in the grass and leaf samples. The average fossil carbon content in the tree leaf samples was approximately 1 %, but in the grass samples the mean fossil carbon ratio was a bit higher, more than 2 %. Close to busy crossroads the fossil carbon ratio can be more than 4 %. Our future plan is to compare the results of radiocarbon measurements with traffic related heavy metal contents in plant samples. Recent study shows that the traffic has a non-negligible contribution to the local CO₂ level and fossil ratio.

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