

**Retrospective estimation of
radiation dose rate and thickness of
central leaf veins of Phragmites
Australis (Cav.) Trin. Ex Steud in the
Chernobyl Exclusion Zone**

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- Observations were conducted in the Chernobyl Exclusion Zone from 2000 to 2020 in the ecosystems of 6 reservoirs, from background radionuclide contamination to the most polluted ecosystem of Lake Glyboke. Samples of water, soil and bottom sediments at the water's edge, and reed leaves were taken.

Materials and methods

- Retrospective estimation of external and internal radiation dose rate for ^{90}Sr , ^{137}Cs and total dose rate at observation sites was performed using the ERICA Assessment Tool software.
- Conducted microscopy of the thickness of the central veins of reed leaves at 30x magnification.
- Statistical analysis of measurement results was performed in the software application Past 4.03.

- To assess the dynamics of dose rate, the data were ranked according to the date of observation, and then the samples of the first (2000-2005) and fourth (2017-2020) quartiles of the data were compared.

- Comparison of the total dose rate of the first and fourth quartiles showed no significant differences between the medians of the samples. Despite the fact that during the 20-year observation period, reed leaves have statistically the same radiation dose rate, the coefficient of variation of the first quartile of observations is three times higher than a similar parameter of the fourth quartile.

Correlation analysis

- For correlation analysis, we used Spearman's coefficient of correlation (r_s). This non-parametric coefficient is the Pearson's coefficient of correlation (Pearson's r) of the ranks.
- The two-tailed (Wilcoxon) Mann-Whitney U test (U) was used to test whether the medians of two independent samples were different
- The Fligner-Killeen test was used to test whether the coefficients of variation (CV) of two independent samples were different.