



## Luminescence properties of the humin fraction isolated from Chernozems and Phaeozems from various regions of Poland

**Jerzy Weber**<sup>1</sup>, Lilla Mielnik<sup>2</sup>, Romualda Bejger<sup>2</sup>, Aleksandra Ukalska-Jaruga<sup>3</sup>, Elżbieta Jamroz<sup>1</sup>, Maria Jerzykiewicz<sup>4</sup>, Irmína Ćwieląg-Piasecka<sup>1</sup>, Andrzej Kocowicz<sup>1</sup>, Magdalena Dębicka<sup>1</sup>, and Jakub Bekier<sup>1</sup>

<sup>1</sup>Wrocław University of Environmental and Life Sciences, Institute of Soil Science and Environmental Protection, Wrocław, Poland ([jerzyweber@gmail.com](mailto:jerzyweber@gmail.com))

<sup>2</sup>West Pomeranian University of Technology in Szczecin, Department of Bioengineering, Physics and Agrophysics Lab, Szczecin, Poland

<sup>3</sup>Institute of Soil Science and Plant Cultivation – State Research Institute, Puławy, Poland

<sup>4</sup>University of Wrocław, Faculty of Chemistry, Wrocław, Poland

Humin fraction of soil organic matter is assigned to play an important role in carbon sequestration and sorption of xenobiotics. This study concerns luminescence properties (fluorescence and delayed luminescence) of humin fraction isolated from mollic horizons of eight Chernozems and Phaeozems, used as arable soils in various regions of Poland. Isolation procedure was described by Weber et al. (2022). Investigated soils differed in the content of TOC, ranging from 13.3 to 41.7 g kg<sup>-1</sup>, as well as texture from loam (Magnice, Pyrzyce) through silt loam (Trzebnik, Ciepłowody, Hrubieszów) and sandy clay loam (Psary) till clay (Ziemnice, Kętrzyn). They also differed in their pH values (from 5.64 to 7.71), and CEC (from 21.6 to 53.2 cmol(+)kg<sup>-1</sup>). Ash content of humin varied between 22.89% - 54.50%, which is typical for humin originated from mineral soils (Stevenson 1994).

### References:

Stevenson FJ. 1994. Humus chemistry: Genesis, composition, and reactions. New York: John Wiley and Sons, p 512.

Weber J., Jamroz E., Kocowicz A., Dębicka M., Bekier J., Ćwieląg-Piasecka I., Ukalska-Jaruga A., Mielnik L., Bejger R., Jerzykiewicz M. (2022). Optimized isolation method of humin fraction from mineral soil material. *Environmental Geochemistry and Health*, 1-10 <https://doi.org/10.1007/s10653-021-01037-3>

### Acknowledgements

This work was supported by the National Science Center (NCN) Poland (project No 2018/31/B/ST10/00677 "Chemical and spectroscopic properties of soil humin fraction in relation to

their mutual interaction with pesticides")