

## DISTRIBUTION PATTERN OF ORGANIC FRACTIONS ISOLATED FROM SOILS OF DIFFERENT TOPOGRAPHY

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This work presents distribution patterns of fractions of soil organic matter (SOM) as a function of topography. Samples were taken from the A-horizons of chernozomic soils (between 138 and 122 m above the sea level) which differ in topography: located on the plateau (P), the upper third of the slope (S) and the toe of the slope (TS). Before the isolation of organic fractions, the coarse debris (>2 mm) was removed by sieving from the air-dried samples. Lipids, fulvic and humic acids were obtained by extractions. After removing proteins and polysaccharides by stepwise acid hydrolysis, the solid residue was demineralised with hydrochloric and hydrofluoric acids to isolate the ROM (refractory non-hydrolysable macromolecular) fraction, as it has been reported by Quénéa et al. (2005). Detailed analyses were performed on the whole samples, the lipid and the ROM fractions, as well as the solid residues after removing fulvic and humic acid. In addition to bulk Rock-Eval parameters, the mathematical deconvolution of pyrograms (Hetényi et al., 2005; Sebag et al., 2005) was used for evaluating the relative contribution of the classes of organic constituents (labile and resistant bio-macromolecules, humic substances) in different fractions.

GC and GC/MS examinations of the non-aromatic hydrocarbon fractions from lipids revealed mainly *n*-alkanes ranging from *n*-C<sub>16</sub> to *n*-C<sub>38</sub> with a considerable contribution of C<sub>18,20,22</sub> *n*-alk-1-enes. The distribution patterns of *n*-alkanes (high CPI, very low *n*-C<sub>22</sub>/*n*-C<sub>23</sub>+ ratio and dominance of *n*-C<sub>29</sub> over *n*-C<sub>33</sub>) suggested C<sub>3</sub> vascular plants as the main organic precursors for all the studied samples. The highest proportion of aliphatic hydrocarbons relative to aromatic ones and the strongest predominance of heavier (>C<sub>26</sub>) *n*-alkanes were measured for TS-sample.

Nearly the same TOC content (2.3 and 2.0 %, respectively), the similar shape and similar results of the mathematical deconvolution of Rock-Eval pyrograms (Fig. 1/), as well as only a slightly different composition of the yields of isolation processes revealed similar SOM for P and TS samples. Differences between these SOMs can be recognized after removing lipids, fulvic and humic acids. Sharply different pyrograms recorded before and after extractions manifested the substantial relative contribution of the thermally more labile components to the SOM at the toe of the slope.

Contrary to the similarities observed both in the amount and in the distribution patterns of SOM taken from the plateau and the toe of the slope, a lower amount of organic matter (TOC: 1.3 %) of conspicuously different composition was found at the slope. The higher importance of the thermally more resistant components in the SOM was clearly shown by the pyrogram monitored on the whole sample (Fig. 1). The calculated proportion of humic substances, in agreement with their isolated amount, is consistent with the topographical position of the sample. The downward moving of fresh plant material and litter resulted in limited relative abundance of bio-macromolecules and higher relative contribution of immature geo-macromolecules (humic substances) at the upper third of the slope and led to the accumulation of more labile organic matter at the toe of the slope.

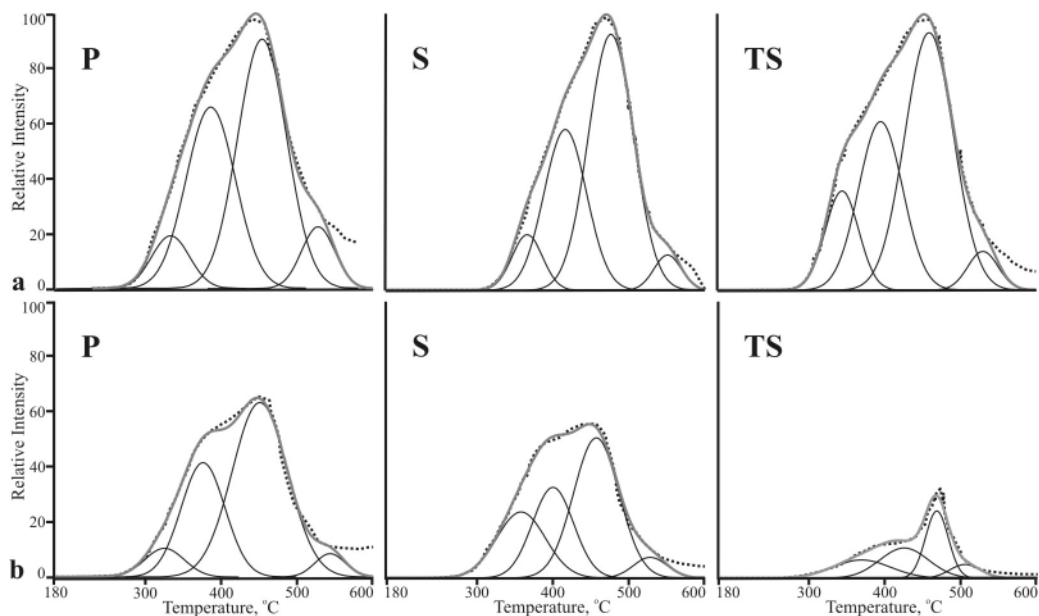


Figure 1. Mathematical deconvolution of pyrograms obtained from (a) whole samples and (b) samples after extraction of fulvic and humic acids. Samples were taken from the plateau (P), the upper third of the slope (S) and the toe of the slope (TS).

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