

Metabolomic variation of *Brassica rapa* (var. raapstelen) and *Raphanus sativus* L. at different developmental stages

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Brassica rapa (var. raapstelen) and *Raphanus sativus* (red radish) are studied for metabolomic changes during plant growth. A non targeted and targeted metabolomic approach by NMR and HPLC, in combination with Principal component analysis (PCA) of the data, was used to identify phytochemicals that were responsive to the different growth time points. By analyzing plants at different developmental stages, we can assess age-dependent changes in primary and secondary metabolites. For leaves of both species, it was observed that amino acids, organic acids, glucose, ascorbic acid, chlorophyll, carotenoids and glucosinolates (3OH-propylglucosinolate, 4-hydroxyglucobrassicin, 4-methoxyglucobrassicin, gluconasturtiin, gluconapin, glucoraphanin, sinigrin) are higher in 6 weeks-old plants as compared to the further old age plant samples, whereas further growth towards 10 weeks resulted in an relative increase in sucrose, phenylpropanoids, tocopherols, two glucosinolates (glucobrassicin, neo-glucobrassicin) and dry weight of leaves as compared to young plants. Almost similar behavior was noticed in the roots. This study reveals the changes in metabolic pool during plant development. The results of this NMR based metabolomic foot printing technique leads to the better understanding of metabolic changes during plant development.