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**Moist storage of *Brassica napus* seeds induces rapid changes in the metabolic profiles of stored material and the resulting oils**

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Cold-pressed rapeseed oils are usually prepared from non-germinated seeds and characterised by a seed-like and nutty smell and taste, which is caused by aroma-active degradation products of seed metabolites such as aldehydes, alcohols, esters and isothiocyanates. However, if seeds start to germinate and microorganisms grow due to unfavorable conditions during storage, oil pressed from this material may show drastically decreased quality. We used a multi-analytical metabolomics approach to characterise the profiles of carbohydrates and organic acids (GC-MS), amino acids (LC-FLD) and glucosinolates (LC-DAD) of non-germinated seeds and seeds kept moist for a few hours up to four days. Additionally, we measured the activities of myrosinases, which are the enzymes that hydrolyse glucosinolates to various breakdown products, including isothiocyanates and nitriles. Moreover, oil was pressed from this material after drying and volatile profiles measured from the resulting oils (GC-MS). The concentrations of several primary metabolites rapidly increased with moist storage, likely indicating the breakdown of storage compounds to support this energy-demanding process. Concentrations of indole glucosinolates increased with a slight time offset, suggesting that amino acids released from proteins were used for their biosynthesis. Myrosinase activities likewise changed over moist storage time and showed a higher affinity towards aliphatic compared to indole glucosinolates. In line with these changes, glucosinolate breakdown products increased in concentrations in the volatile profiles of the oils, negatively affecting their sensory quality. Our metabolomics approach thus provides a direct time-resolved link between changes in metabolism of seed material under moist storage conditions causing germination and the chemo-sensory quality of the resulting oils.

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