

USING TDU-GC-MS TO INVESTIGATE THE VOCS EMISSION OF *BRASSICA NAPUS* L. PLANTLETS CULTIVATED *IN VITRO* AND EXPOSED TO CADMIUM ABIOTIC STRESS.

Bastien Durenne¹, Alodie Blondel¹, Philippe Druart¹, Marie-Laure Fauconnier²

¹ Department of Life Sciences, Bioengineering unit - CRA-W, Chaussée de Charleroi 234, 5030 Gembloux, Belgium

² Chimie Générale Organique - Université de Liège - Gembloux Agro-Bio Tech, 2, Passage des Déportés, 5030 Gembloux, Belgium

Oilseed rape is grown throughout the world as a source of oil and protein for food and feed or biofuel [1]. Diffuse Cadmium sources, notably P-fertilisers and atmospheric depositions contribute to concentrate Cd into agricultural soils [2]. Some species like *Brassica napus* L. have been confirmed as having high ability to Cd-accumulation and tolerance [3]. Finally, emission of volatile organic compounds (VOCs) looks promising tool as non-invasive marker of abiotic stress regarding phenotypic dynamics [4]. As the relationship between VOCs phenotyping and oilseed rape Cd exposure is poorly documented, investigations started on this topic using *in vitro* plantlets within sterile and controlled conditions (temperature, light...). Therefore, a first step was the set-up of an open enclosure glass system allowing the growth of *Brassica napus* plantlets. In order to perform the measurements, the air (filtered via two activated charcoal filters) is supplied to the system by a diaphragm pump connected with Teflon® tubes. Plant VOCs trapping and blanks are performed with Tenax® TA adsorbents cartridges at a constant flow of approximately 0,150 L.min⁻¹ and with a sampling time of 24 hours. Adsorbents cartridges are analyzed with a combined Gerstel® automated TDU and an Agilent® 7890 GC-MS combining scan and sim mode based on specific ions. Preliminary qualitative results are in accordance with the literature regarding VOCs emission by oilseed rape plants and mostly represented by the following compounds: α -thujene, β -terpinene, Δ -3-carene, β -myrcene, D-limonene, β -ocimene and β -elemene. The comparison of the results with those of *Brassica napus* clones submitted to increasing Cd concentrations is in progress in order to investigate the relationship between VOCs emission and cadmium tolerance.

[1] Evans N. *et al.* Food Security 2 (2010) 143

[2] Smolders E. *et al.* Environmental Pollution 22 (2010) 283

[3] Yan H. *et al.* Environmental Science and Pollution Research (2015) 1

[4] Niederbacher B. *et al.* Journal of Experimental Botany 66 (2015) 5403