Establishing an analytical method for determination of carotenoid compounds extracted from *Rhodotorula toruloides* and *Rhodotorula babjevae*

Yashaswini Nagavara Nagaraj,[a] Viktoriia Burkina,[a] Laura Okmane,[a] Mats Sandgren,[a] Sabine Sampels,[a] **Volkmar Passoth,[a]**

[a] Dept. of Molecular Sciences, Swed. Univ. of Agricultural Sciences (SLU), Uppsala, Sweden

Carotenoids belong to the most widespread natural colouring agents. Some yeast strains contain essential micronutrients and potent natural anti-oxidants. The main objective of this study was to investigate the carotenoid content and composition in two oleaginous yeasts, *Rhodotorula toruloides* and *Rhodotorula babjevae*.

The oleaginous yeasts were grown in shake flasks on lignocellulose hydrolysate for 4 days and the cells were then harvested and freeze-dried. Traditional acetone-extraction method was adopted for the extraction of the carotenoids from the freeze-dried yeast cells. The extracted samples were subsequently analysed by Ultra High Performance Liquid Chromatography (UHPLC). The UHPLC method was optimised and validated for eight carotenoids: α-, β-, γ-, δ-, ε-carotene, astaxanthin, canthaxanthin and lycopene for linearity, precision and recovery.

A number of carotenoids were identified in the yeasts, including β- and γ- carotene. We also found that some triglycerides were co-extracted with the acetone method, which may question earlier reports on carotenoid amounts produced by red oleaginous yeasts.

We established methods that will make it possible to investigate and optimize carotenoid production in red yeasts. The optimized analytical method will be interesting not only for carotenoid determination in microbes, but also for food industry and aquaculture.