

Evaluation of carotenoids and lipids production by two isolated *Rhodosporidium kratochvilovae* strains using galactose-based media

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Introduction

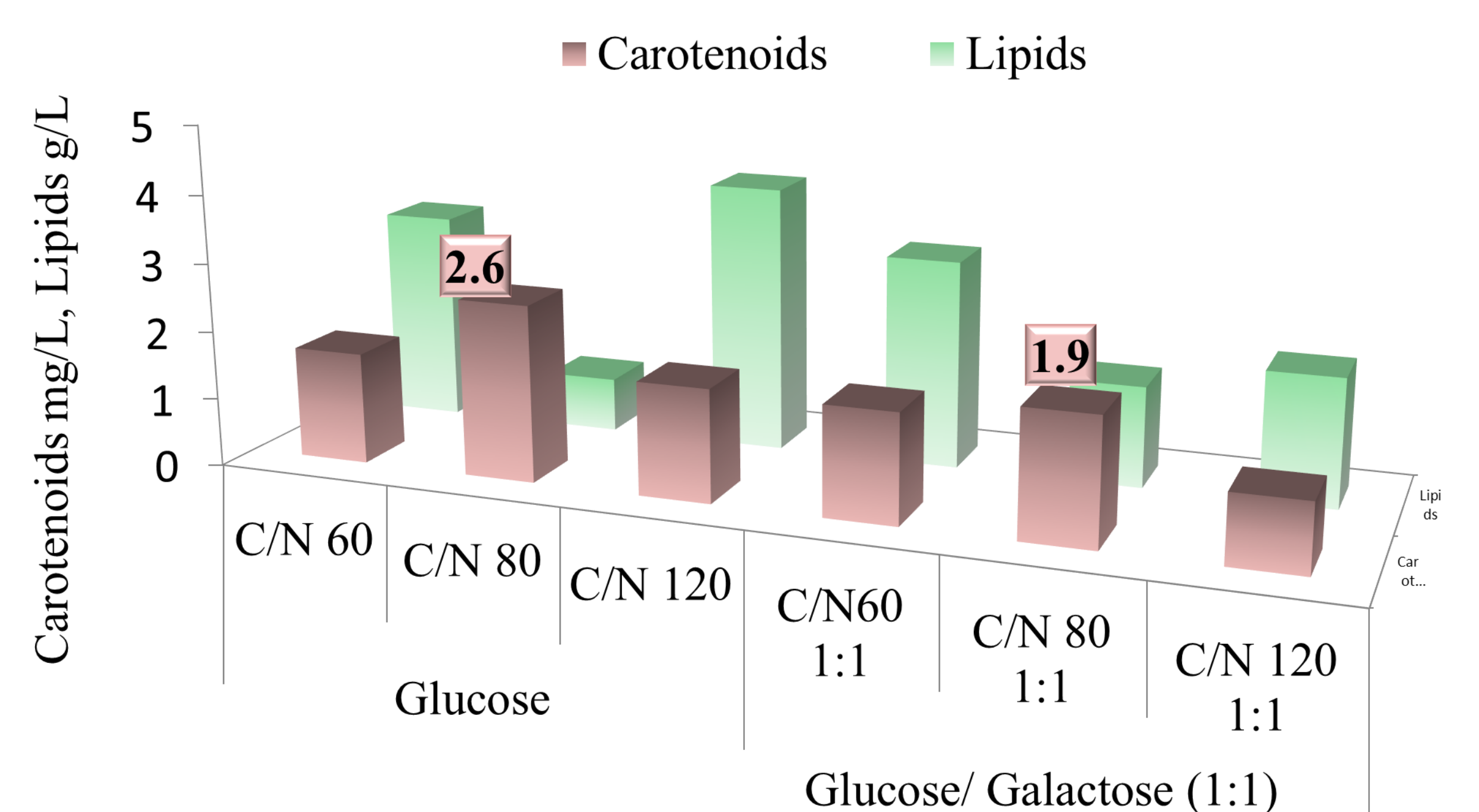
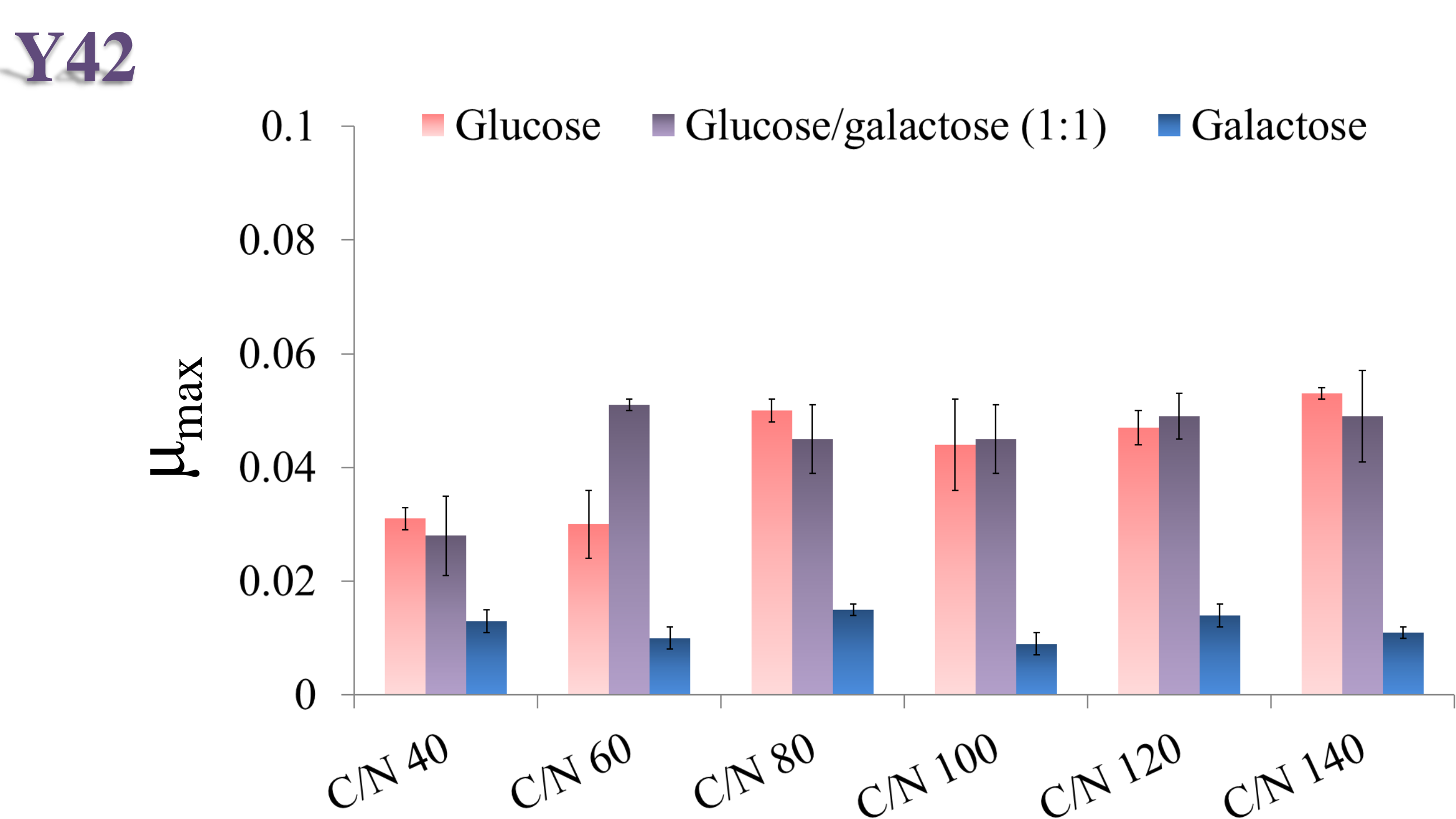
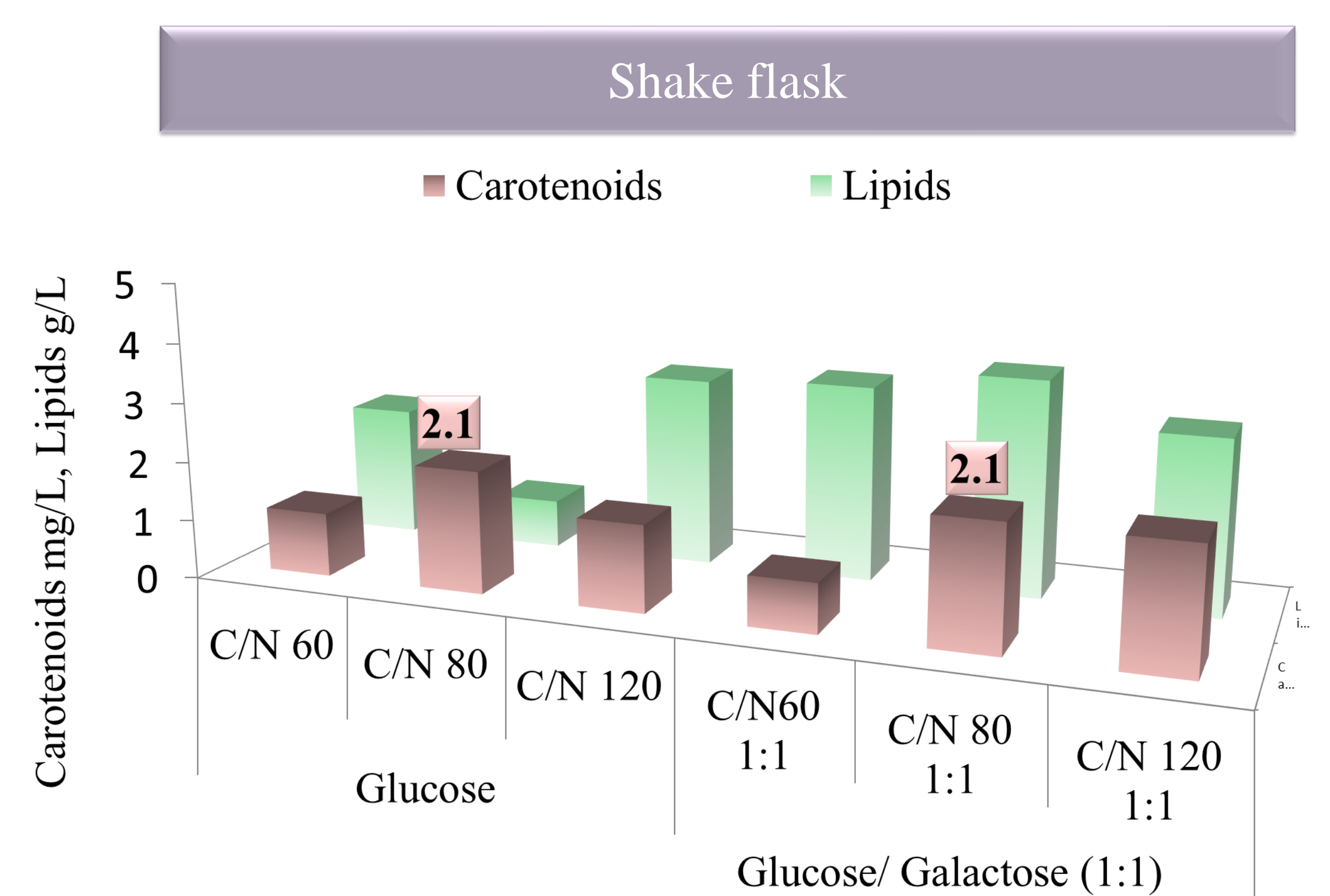
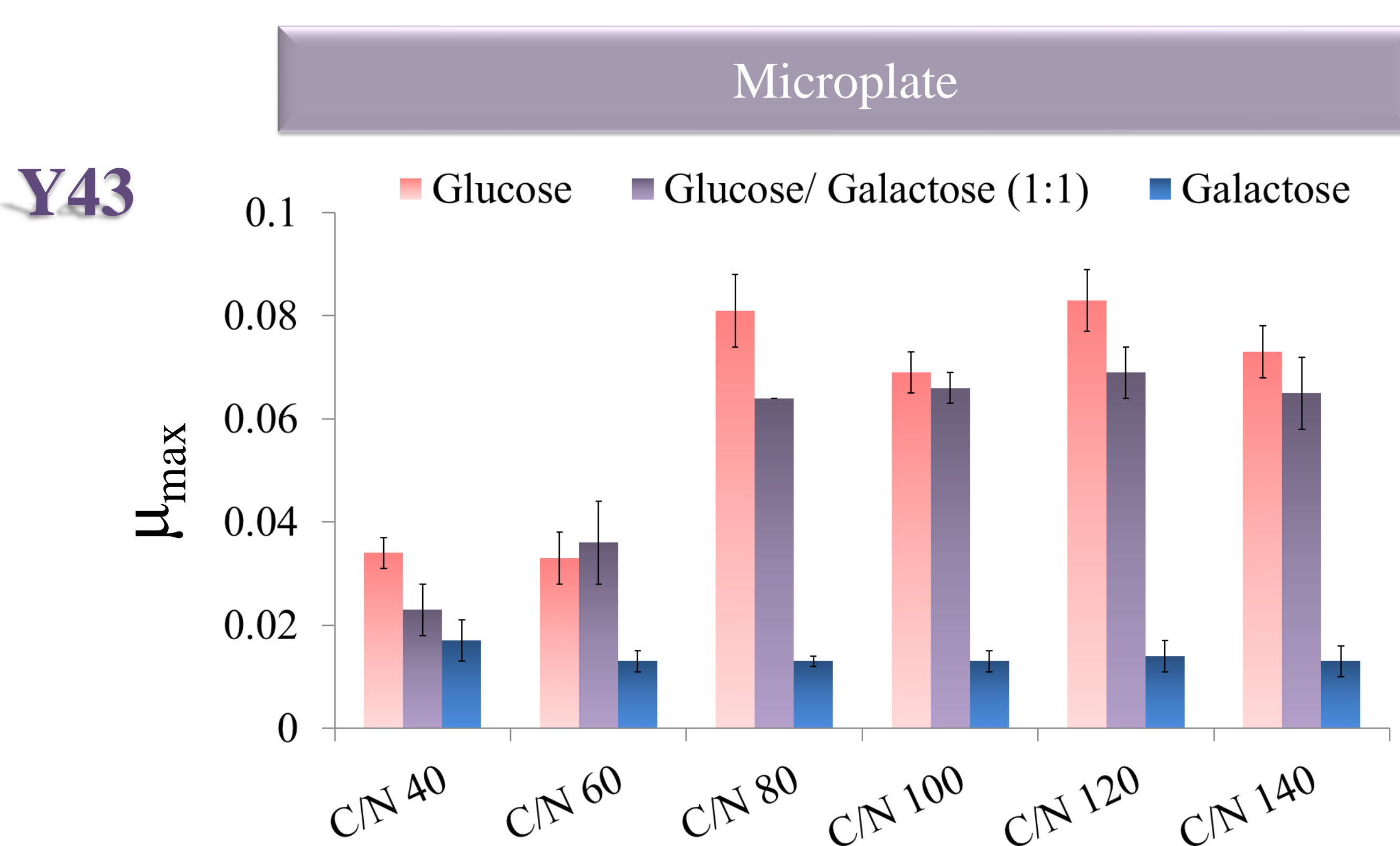
Red yeasts belonging to *Rhodosporidium* genus are well-known for their ability to produce lipids and carotenoids. The vast majority of the studies have been primarily focused on lipid production, while only a few are oriented towards carotenoids synthesis and/or the effect of fermentation conditions on the production of both lipids and carotenoids. Additionally, cheese whey utilization, as a low-cost carbon source, encounters important limitations in the case of *Rhodosporidium* sp., due to the lack of beta-galactosidase enzyme.

In view of the above, this study aimed to evaluate the behaviour of two isolated *Rhodosporidium kratochvilovae* strains towards carotenoids and lipids production, in substrates simulating the sugar composition of cheese whey.

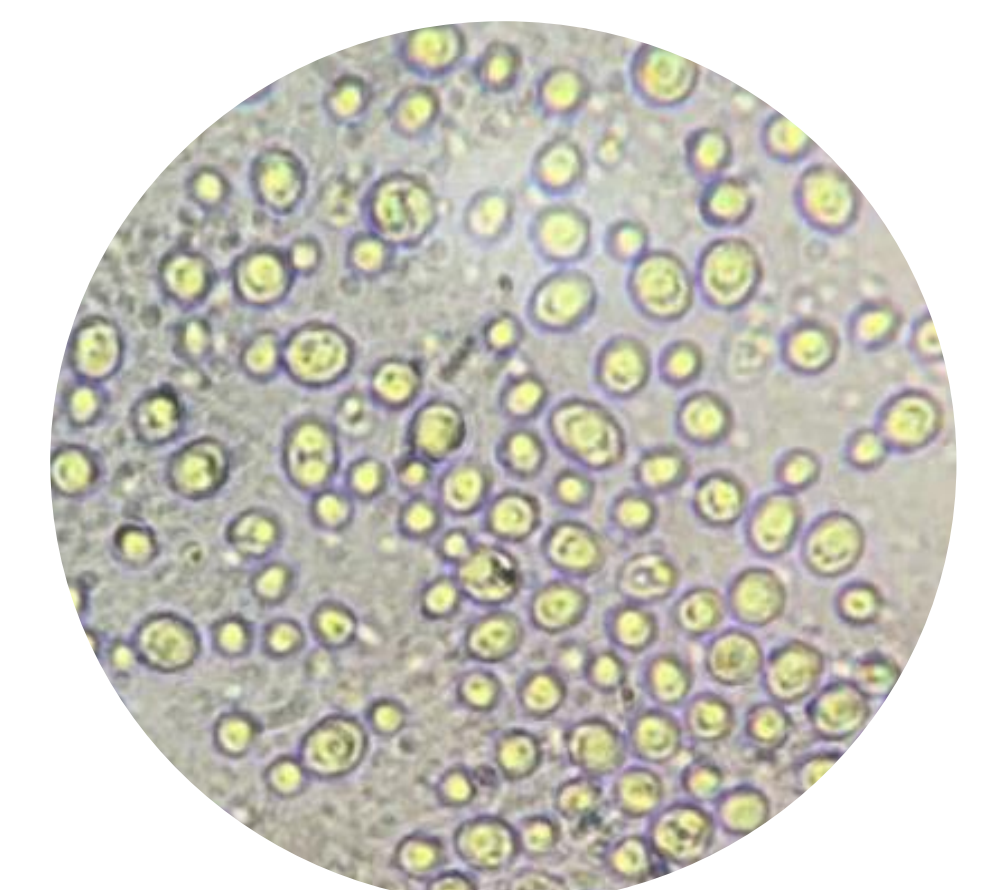
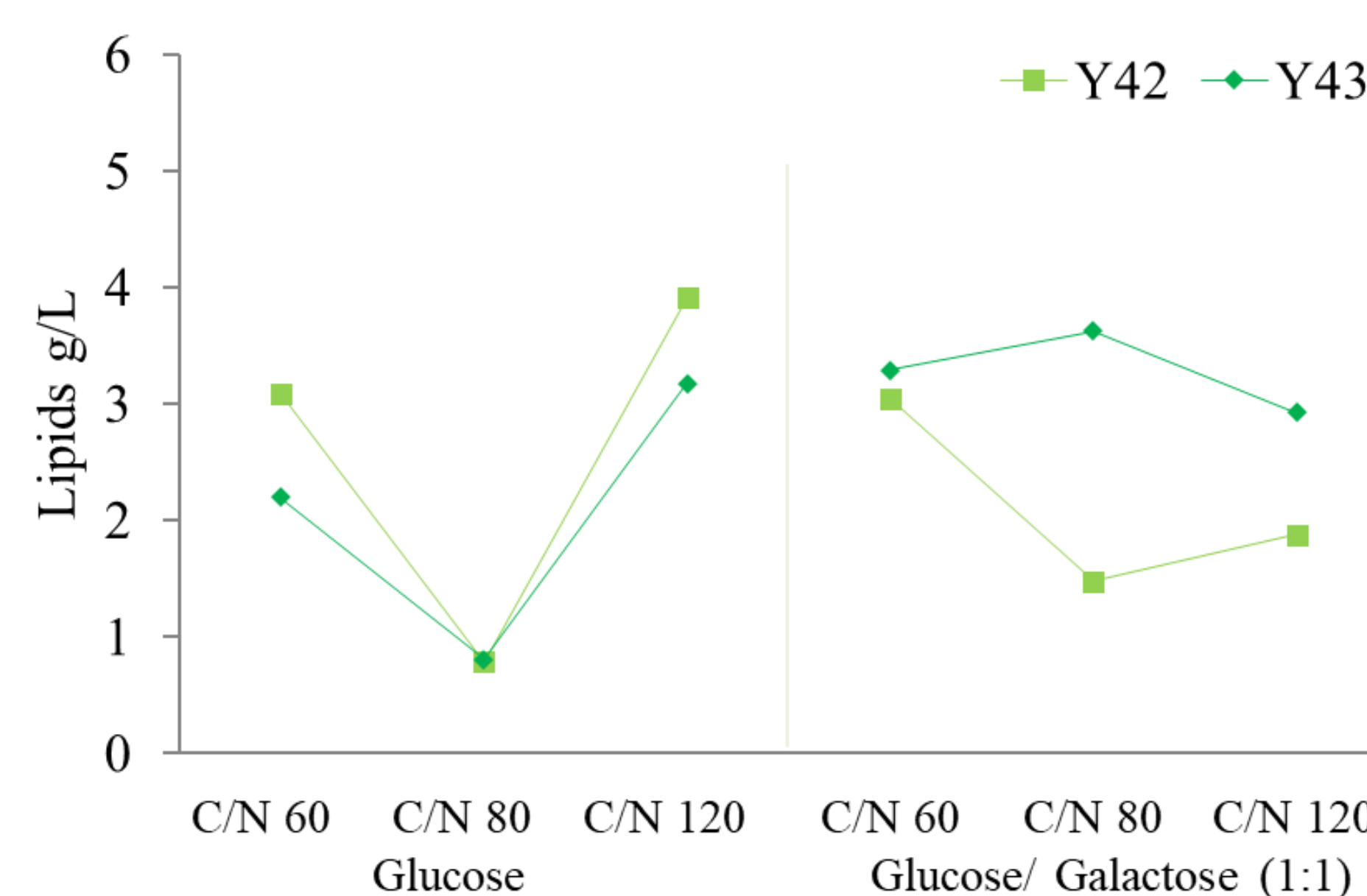
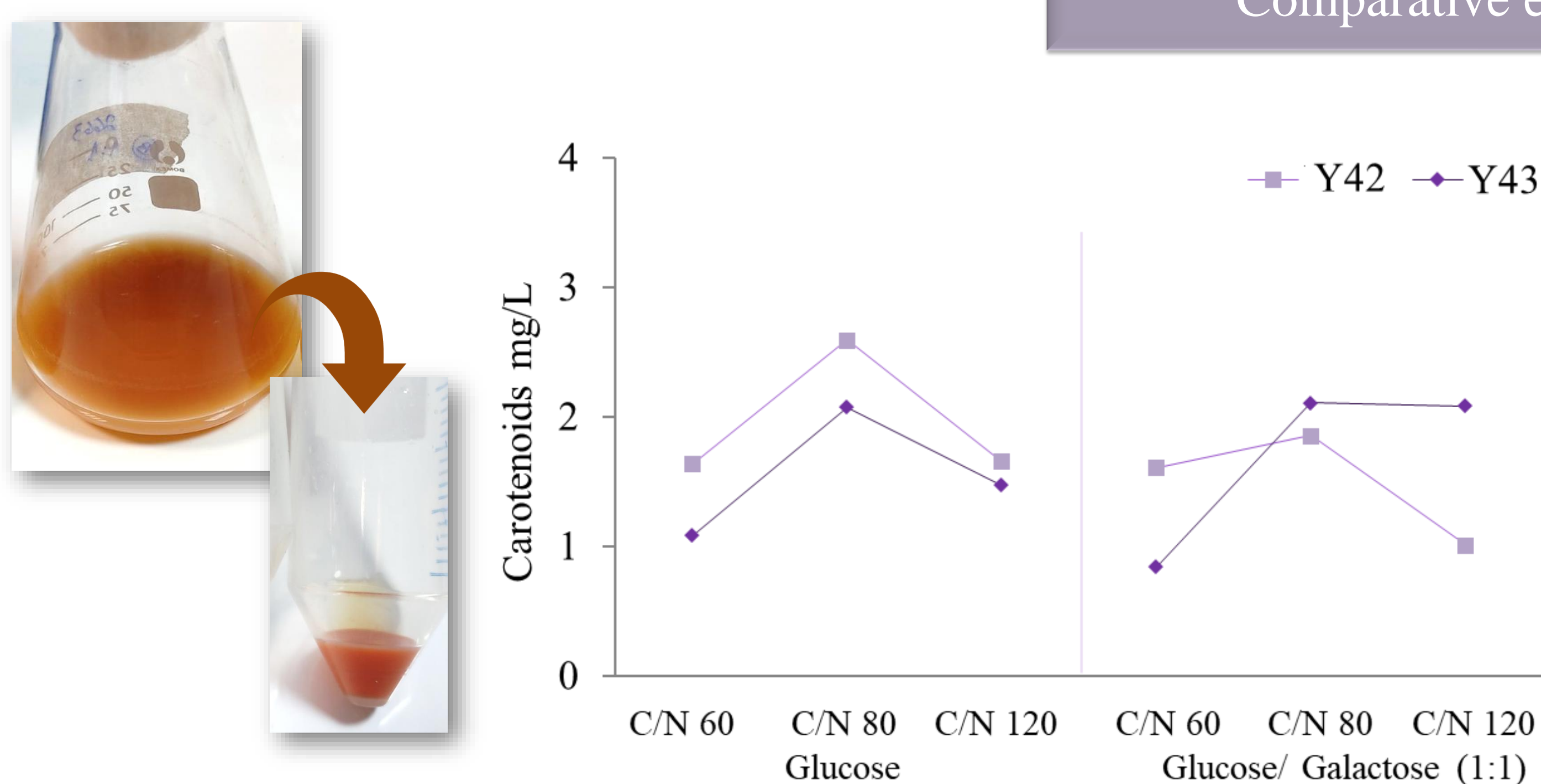
Experimental set-up

- ❖ **Microorganism:** *Rhodosporidium kratochvilovae* strains (FMCC Y-42, Y-43)
- ❖ **Medium:** Glucose, galactose & glucose:galactose 1:1 were used as carbon sources, yeast extract and $(\text{NH}_4)_2\text{SO}_4$ were utilized as nitrogen sources, while a mixture of trace elements was also applied.
- ❖ **Different C/N ratio** were applied by modifying the $(\text{NH}_4)_2\text{SO}_4$ concentration
- ❖ **Experiments:** microplate 28 °C, agitation; shake flasks 28 °C, 180 rpm
- ❖ **Carotenoids extraction:** Buzzini et al. (2007) and Lopes et al. (2017)
- ❖ **Lipids extraction:** Folch et al. (1957) and Patel et al. (2015)

Results & Discussion



Comparative evaluation Y-42 & Y-43



Acknowledgements

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Conclusions

- ✓ Opposite production patterns were observed for carotenoids and lipids.
- ✓ Lipids were produced against the synthesis of carotenoids, indicating the metabolic competition between these two metabolites.
- ✓ Maximum carotenoid production was favored at C/N 80.
- ✓ Further studies are necessary to evaluate the metabolic shift between carotenoids and lipids.

References

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Folch et al. (1957) J. Biol. Chem. 226, 497.
Lopes et al. (2017) Food Sci Biotechnol., 26(3), 759-766.
Patel et al. (2015) Bioresource Technology, 188, 136-144.

