

## AGRI-FOOD WASTES AS AN EFFICIENT SUBSTRATE FOR THE PIGMENTED YEAST CULTIVATION

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**Background:** Agri-food wastes represent an increasingly acute global problem, with approximately one billion tons generated worldwide each year. In addition to the high costs associated with its management, it also creates serious environmental problems. At the same time, agri-food wastes are a sustainable source of various substances with biological activity and nutritional value, which can be used in animal feed or as a substrate for the production of value-added products. In this context, the utilization of agri-food wastes in various biotechnological processes, as a nutrient substrate for the cultivation of microorganisms and the synthesis of biologically active substances, is a promising research direction. Yeasts are considered excellent producers of biologically active compounds because they are characterized by a high rate of biomass accumulation, the ability to metabolize a wide range of carbon sources, resistance to contamination by foreign microflora, and the capacity to grow on relatively inexpensive nutrient media, including by-products from the agricultural and food industries. This significantly reduces the production costs of biologically active substances.

**The aim of this research** was to evaluate the influence of liquid nutrient media based on carrot and/or celery wastes on the synthesis of exometabolites in the culture liquid of the *R. gracilis* CNMN-YS-03 and *R. mucilaginosa* CNMN-YS-10 pigmented yeast strains.

**Materials and methods:** Spectrophotometric methods were used to determine the content of proteins, carbohydrates, and total antioxidant activity (TAA) in the culture liquid.

**Results:** It was established that the culture liquid obtained after cultivating the *R. gracilis* CNMN-YS-03 strain on YPD nutrient medium contained up to 52.22±1.72% d.w. proteins, 3.93±0.09% d.w. carbohydrates, and exhibited a TAA of 75.11±1.29% inhibition. For the *R. mucilaginosa* CNMN-YS-10 strain, these values were 60.93±4.99% d.w. proteins, 4.10±0.16% d.w. carbohydrates, and the TAA of 83.64±5.50% inhibition. The use of nutrient media based on aqueous extracts of carrot peels, celery peels, and the 1:1 mixture of carrot and celery peels as the sole nutrient source significantly increased ( $p \leq 0.05$ ), depending on the used strain and medium, the protein content by up to 39.1%, the carbohydrate content by 2.9-4.2 times, and the TAA in the culture liquid by up to 106.6%, compared to the YPD control medium.

**Conclusions:** Thus, agri-food wastes represent a sustainable and efficient substrate for the cultivation of pigmented yeasts. Nutrient media based on carrot and celery wastes stimulate the synthesis of exometabolites. The culture liquid obtained after cultivating *Rhodotorula* yeasts on these media exhibits high antioxidant activity and is a natural source rich in proteins and carbohydrates, paving the way for its multiple applications in various fields.

**Keywords:** yeasts, carrot peels, celery peels, culture liquid

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