

New formulation of production media for submerged cultivation of *Aspergillus niger* for production of pectinase

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INTRODUCTION

Pectinase is a generic term that used from derivation of the pectin. Pectin is a complex class of carbohydrates polymer which composed of members galacturonic acid that linked through the α -1-4 glycosidic linkage and it is widely found in the primary cell walls or at the middle lamella of higher plants. Furthermore, Among different biofactories of pectinases, the filamentous fungi provide a potentially high yielding and relatively cheap option and the genus of *Aspergillus* has been used with a success as a production host.

Therefore, the objective of this research is to develop industrial production media and a cultivation strategy for the production and secretion of pectinases in a semi-industrial scale by *A. niger*. In this study, the submerged cultivation was chose as a cultivation strategy for the production and secretion of pectinase in a semi-industrial scale by *A. niger*.

METHODOLOGY

STAGES 1

Development of master and working cell banks

- 1) Master cell bank
- 2) Working cell bank

STAGES 2

Cell cultivation in liquid media

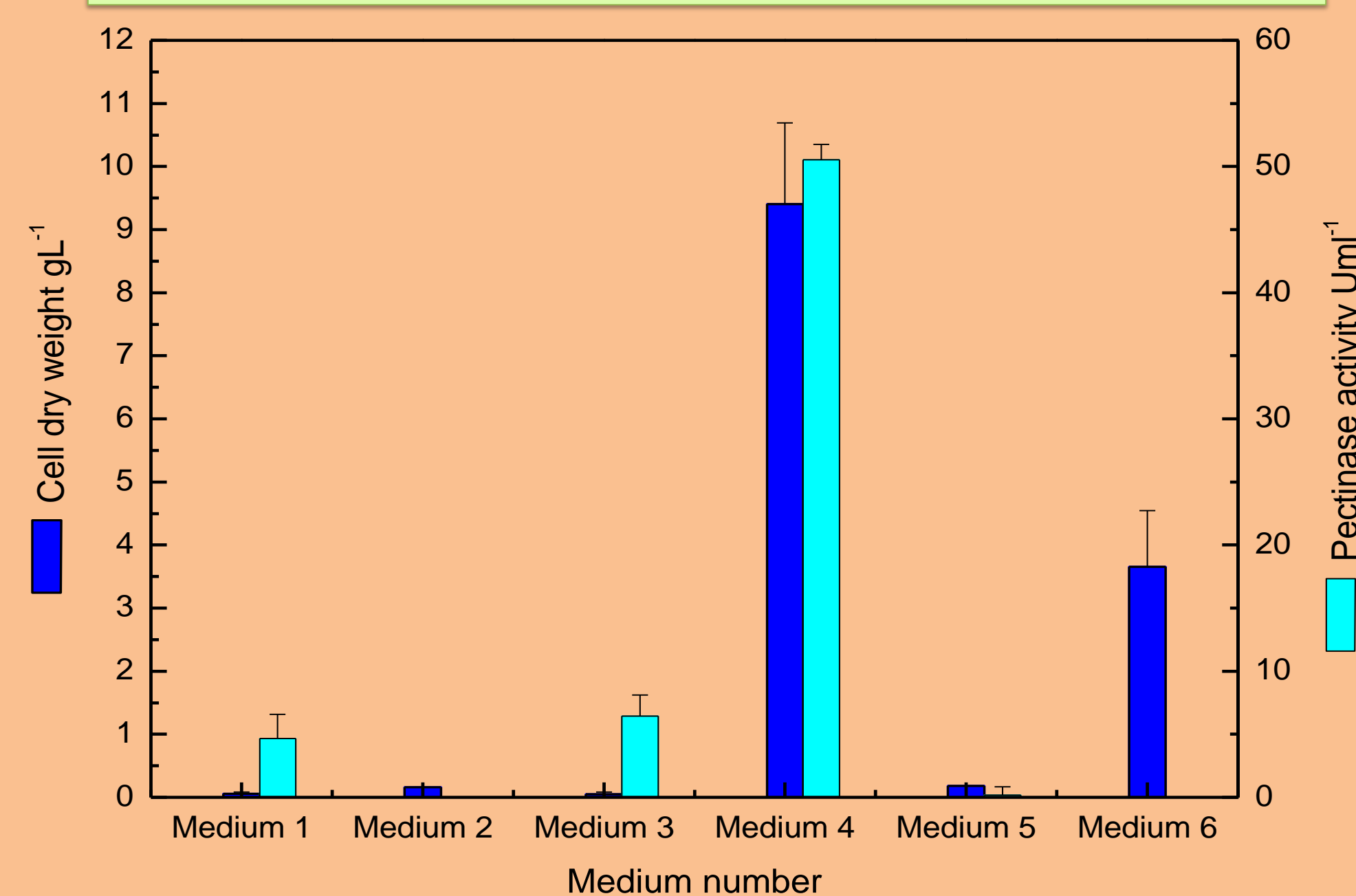
- 1) Shake flasks media screening
- 2) Shake flasks media growth study
- 3) Studies of different medium composition

CONCLUSION

This work present the best carbon source for the production of pectinolytic enzyme in submerged fermentation was apple pectin based on the total enzyme produced and its biomass production

RESULT AND DISCUSSION

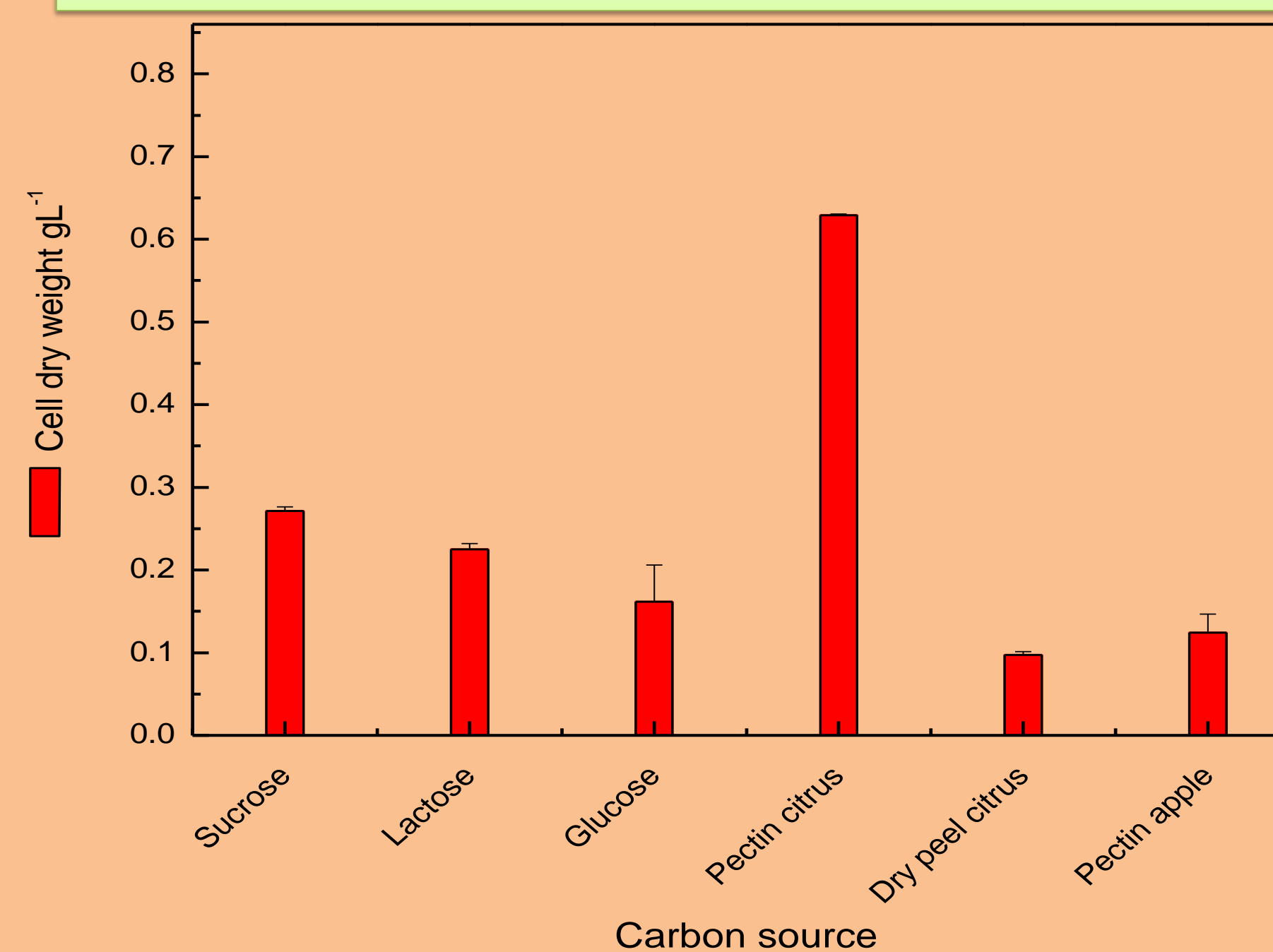
PECTINASE PRODUCTION IN DIFFERENT MEDIA



Medium no.	Pectinase activity (U/ml)
1	4.68025
2	-0.07933
3	6.42543
4	50.53086
5	0.15885
6	-2.61777

Figure 1: Cell dry weight and pectinase activity for six different media under screening process (30°C and 200 rpm)

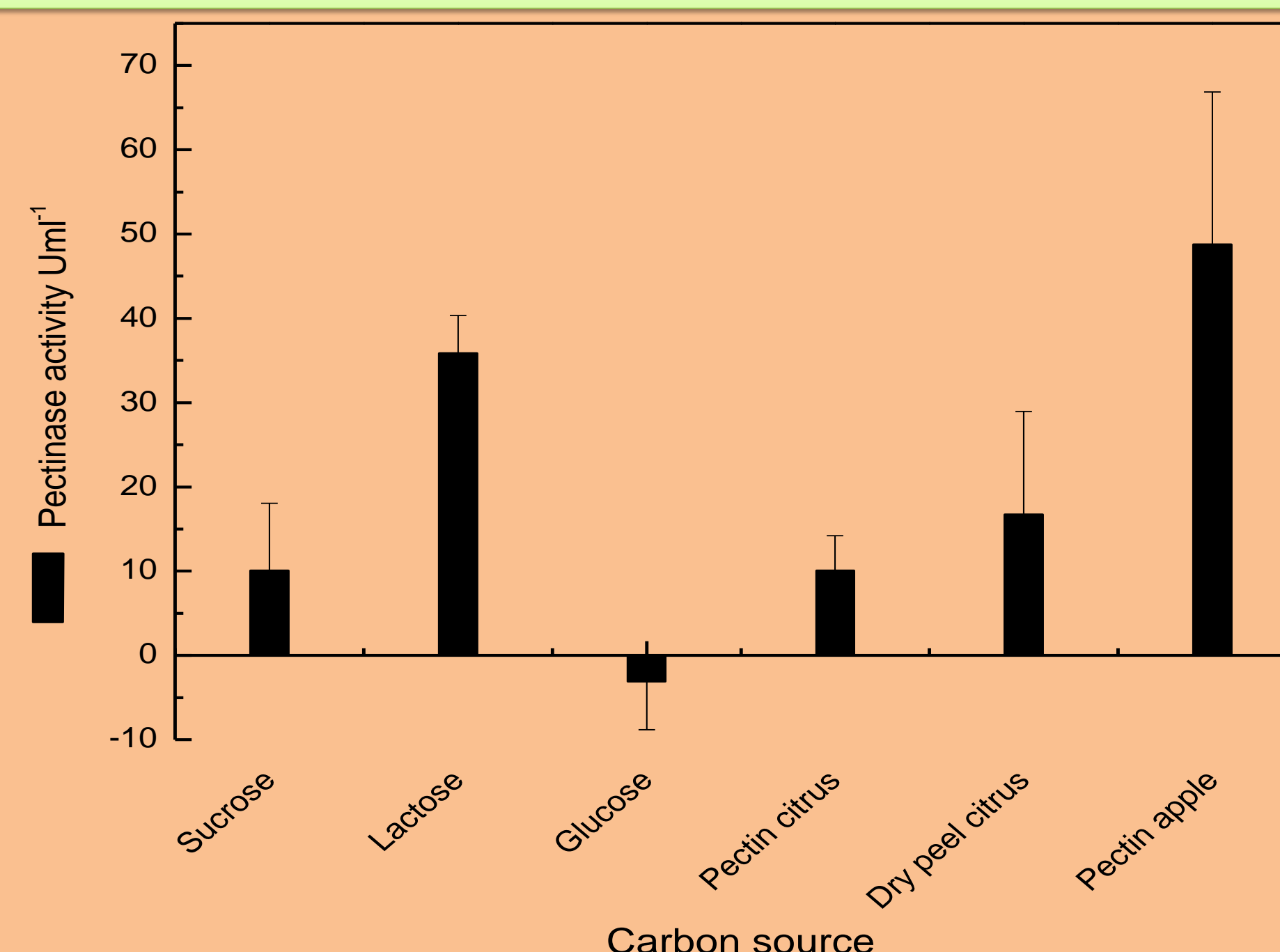
CELL DRY WEIGHT IN DIFFERENT CARBON SOURCE



Carbon sources	Cell dry weight (g/L)
Sucrose	0.2715
Lactose	0.225
Glucose	0.1615
Pectin citrus	0.629
Dry peel citrus	0.0975
Pectin apple	0.124

Figure 2: Cell dry weight for six different carbon source under different medium composition (30°C and 200 rpm)

PECTINASE PRODUCTION IN DIFFERENT CARBON SOURCE



Carbon sources	Pectinase activity (U/ml)
Sucrose	10.07444
Lactose	35.85549
Glucose	-3.09373
Pectin citrus	10.07444
Dry peel citrus	16.73785
Pectin apple	48.78568

Figure 3: Pectinase activity for six different carbon source under different medium composition (30°C and 200 rpm)

The highest total enzyme was obtained from apple pectin as a carbon sources, 48.78568 U mL⁻¹ followed by 35.85549 U mL⁻¹ with lactose, 16.73785 U mL⁻¹ with dry peel citrus pectin, 10.07444 U mL⁻¹ with sucrose (as a control) and citrus pectin and the lowest total enzyme was obtained from glucose as a carbon sources, -3.09373 U mL⁻¹.

Whereas, the biomass production showed maximum cell mass was 0.629 g L⁻¹ with citrus pectin, compared with 0.2715g L⁻¹ with sucrose, 0.225 g L⁻¹ with lactose, and 0.1615 g L⁻¹ with glucose, 0.124 g L⁻¹ with apple pectin and 0.0975 g L⁻¹ with dry peel citrus pectin