Chapter 2

SELECTION OF THE MEDIUM FOR THE MAINTENANCE OF ALCOHOL AND TEMPERATURE RESISTANT *Saccharomyces cerevisiae* Y_{B23}

Chapter 2

SELECTION OF THE MEDIUM FOR THE MAINTENANCE OF ALCOHOL AND TEMPERATURE RESISTANT *Saccharomyces cerevisiae* Y_{B23}

Microorganisms require sufficient amount of energy to maintain their life activities. As *Saccharomyces cerevisiae* is a chemotrophic microorganism, it receives its energy from several chemical nutrients, such as: C, N, S, P, Na, K, Ca, Mg, Fe, Mn, Zn, Cu, Co, Mb, several vitamins & minerals, to keep on its metabolic activities in proper order, which will promote its growth & biological functioning. So, we must keep in mind, the cultivation of microorganism must be done in such a medium, which can supply sundry nutrients in sufficient amount. We know that a synthetic medium is a chemically defined media composed of known pure chemical substituents. So, the resistant strain *Saccharomyces cerevisiae* Y_{B23} which is resistant to ethanol & temperature is to be grown & subcultured in a definite synthetic medium, so that its alcohol producing efficiency remains constant. In the present study, we observed that the said strain isolated from 7.5% alcohol & 28-30°C temperature, degenerated to show decreasing alcohol producing efficiency, when grown in YPD agar slant & subcultured in the same medium for 12 months. Thus, for better maintenance of *Saccharomyces cerevisiae* Y_{B23} & better alcohol production, the following three media were tested for their suitability. Their compositions are given below-

Composition of Medium I	Composition of Medium II	Composition of Medium III
Glucose - 1.0%	Peptone – 0.5%	Glucose – 1.0%
Yeast Extract – 0.5%	Yeast Extract – 0.5%	$(NH_4)_2SO_4$ – 0.5%
Peptone – 0.5%	Beef Extract – 0.3%	KH_2PO_4 – 0.1%
Agar – 4.0%	Agar – 4.0%	$MgSO_4,7H_2O$ – 0.025%
pH – 5.0	pH – 5.0	$FeSO_4,7H_2O$ – 0.002%
		Biotin – 0.2µg/ml
		Agar-4.0%
		pH – 5.0

When the *Saccharomyces cerevisiae* Y_{B23} strain was maintained in those three media separately & alcohol production was measured, we got the following results as in Table 1.

Table. 1. Alcohol production by *S.cerevisiae* Y_{B23} maintained in different medium:

Maintenance medium	% of Alcohol produced								
	Initial	**1 month**	**2 month**	**3 month**	**4 month**	**6 month**	**8 month**	**10 month**	**12 month**
I	3.4±0.01	3.4±0.03	3.0±0.02	2.7±0.01	2.0±0.04	1.2±0.005	0.7±0.003	0.3±0.001	0.0±0.0
II	3.4±0.02	3.4±0.01	3.2±0.05	2.6±0.03	2.1±0.01	1.6±0.008	1.3±0.006	1.0±0.01	0.8±0.004
III	3.4±0.03	3.4±0.03	3.4±0.02	3.4±0.04	3.4±0.02	3.4±0.04	3.4±0.04	3.4±0.03	3,4±0.05

Production values are expressed as mean ± SD.

All values are biologically significant ($p<0.001$).

Table.1. shows that the alcohol production (%) by the alcohol and temperature resistant strain *Saccharomyces cerevisiae* Y_{B23} subcultured in **medium III** for 12 months is relatively stable in comparison with the two other maintenance media (**medium I & medium II**). So medium III was finally selected for the maintenance of the alcohol and temperature resistant strain *Saccharomyces cerevisiae* Y_{B23}.