

The Influence of Aneurine Hydrochloride on the Growth of *A. Clavatus-24* and on the Production of Citric Acid by Submerged Fermentation

Dr. Jitendra Kumar Singh

Assistant Prof., SRVS M.M.V Panchferwa, Chandauli(U.P)
E-mail: vibhashranjan5021@gmail.com

Abstract—The influence of aneurine hydrochloride on growth of the mold *A. clavatus-24* and on the citric acid production has been studied. It has been observed that lower concentration ($1.0 \times 10^{-5}M$) of aneurine hydrochloride is not so effective on the growth of mold *A. clavatus-24* as well as the citric acid production while. The higher concentration ($4.0 \times 10^{-5}M$) is favourable for the growth of mold *A. clavatus* as well as the citric acid production. It has been found that maximum amounts of the growth of the mold were recorded as 1.3885g, and 4.0135 g at different periods of incubation while that of produce-citric acid were 2.7013g, and 7.382g at 5 days of incubation period respectively and were found to be far better than that in controls. It was also observed that $4.0 \times 10^{-5}M$ concentration of aneurine hydrochloride was the optimum for the maximum growth of the mold. *Aspergillus clavatus-24* as well as citric acid production.

Keywords - Aneurine hydrochloride, *A. clavatus-24*, citric acid)

1. INTRODUCTION:-

Aneurine hydrochloride is also known as Vitamin B₁

Experimental:

The composition of the production medium employed has been prepared as.

Sucrose	: 720.00g (15%)
NH ₄ NO ₃	: 12.00g+0.5%
MgSO ₄ 7H ₂ O	: 1.20g+0.05g
KH ₂ PO ₄	: 4.80g+0.5g
Dist. Water	: 2.40litres

The PH of the medium was adjusted to 2.2 by adding requisite amount of HCl buffer So- and This PH was also ascertained by PH- meter The above composition medium represents the volume of the medium and it was divided into 48 equal parts. Each part was taken in a separated 250 ml flat bottom ferment or flask. The above 48 fermenter flasks were then arranged in three sets each comprising of fifteen ferment to flasks. The remaining three ferment flasks were kept as controls. Each set was re arranged is five sub-sets, each comprising of three fermentor flasks. After preparing the above set of fermentor flasks M /1000 Solⁿ 1.0ml, 2.0ml and 3.0 ml of the solⁿ were added to the 1st, 2nd and 3rd subsets of all The Three sets of the flasks respectively similarly 4.0ml and 5.0 ml of the solⁿ were added to the 4th and 5th sub-sets respectively. The control flask contained no aneurine hydrochloride. Now, the total volume in each fermentor flask was made up 100 ml by adding requisite amount of distilled water. Thus the molar concⁿ of amount of distilled water. Thus the molar conc^c of aneurine hydrochloride in the 1 st, 2nd, 3rd, 4th and 5th subsets were approximately as given below:-

- A x 10⁻⁵M
- 1.0x10⁻⁵M
- 2.0x10⁻⁵M

$3.0 \times 10^{-5} \text{M}$

$4.0 \times 10^{-5} \text{M}$

$5.0 \times 10^{-5} \text{M}$

Where A = Amount of aneurine hydrochloride in ml ie 1.0ml to 5.0

x = Morality of the anurine hydrochloride. The above fermentor flasks were than sterilized, cooled inoculated and analysed after 5 days 10 days and 15 days for acid formed and sucrose left unfermented.

He influence of aneurine of aneurine hydrochloride on the growth of *A. clavatus*-24 and citric acid production.

Concentration of Growth of the mold* Yield of citric Sugar left* g/100 ml

aneurine hydrochloride $A \times 10^{-5} \text{m}$	g/100 ml			acid*g/100ml					
	5	10	15	5	10	15	5	10	15
$1.0 \times 10^{-5} \text{M}$	1.0813	1.7953	2.348	1.6289	2.45.11	4.5311	9.1359	6.0713	4.5311
$2.0 \times 10^{-5} \text{M}$	1.1215	1.8930	3.1795	1.6712	2.4553	9.2350	8.7116	6.0618	4.2350
$3.0 \times 10^{-5} \text{M}$	1.2769	2.5982	3.4739	1.8913	3.0182	4.2112	8.4356	5.7539	4.2112
$4.0 \times 10^{-5} \text{M}$	1.3885	2.8753	4.0135	2.7013	4.4785	3.7875	6.1732	4.5662	3.7875
$5.0 \times 10^{-5} \text{M}$	1.3636	2.5910	3.5139	2.4815	3.4113	3.3991	6.997	5.4748	3.991
Control	1.5639	2.6813	3.2126	1.1653	3.4334	4.4052	12.6970	7.513	4.4052

* Each value represents mean of three trials Experimental deviation (+_) 1.5 to 3.5%

Results and Discussion

The data given in the table 1 indicate that the lower concentration ($1.0 \times 10^{-5} \text{M}$) of aneurine hydrochloride caused minimum growth of the mold a recorded at different periods of incubation were 1.3885g, 2.8753g and 4.04135 and these amounts of growth were also found to be better than that in the controls except i the case of 5 days of incubation

The influence of anurine hydrochloride on the production of citric acid was found to be very significant. Like the growth of the mold, lower concentration ($1.0 \times 10^{-5} \text{M}$) favoured. the maxi mum production of citric acid. These maximum yield of citric acid wit 5 days, 10 days and 15 days of incubation were 2.7013g 4.4785 and 7.3829g respectively and they were found to be far better than that in the controls. It was further observed that both of the maximum growth of the mold *A. clavatus*-24 as well as for the production of citric acid $4.0 \times 10^{-5} \text{M}$ conc⁻ⁿ of aneuridne hydrochloride was the optimum.

As far as the consumption of sugar during the course of citrric acid fermentation was concerned, it was observed that the consumption of sugar was proportional to the production of citric acid that is the lower yield of citric acid corresponded with the smaller consumption of sugar and similarly higher yields with higher consumption.

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