

## **The influence of of nicotinic acid on the growth of A. clavatus- 24 on the production of critic acid by submerged fermentation**

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### **Abstract :-**

The influence of nicotonic acid on the growth of A. Clavatus-24 on the production of critic acid by submerged fermentation has been studied. It has been found that the influence of nicotinic acid on the production was not encouraging and it deactivates. The enzyme system thereby reduction the activity A/Clavatus. 11.The concentration of nicotinic acid as well as incubation period has an important role to the yield of citric acid.

(keywords: Critic acid,A/Clavatus -A/24, Nicotinic acid)

### **Introduction :-**

Nicotinic acid is a vitamin B<sub>5</sub>.It is not found in free state except in the urine of animals, but occurs in the form of amide. It occurs in all living cells in animals amounts the important source are Wheat,Yest,Liver,Adrenal Gland, Barley,Maize and Rice. The acid was first prepared by Hoper1867. and the possibility that this acid might have biological activity was emphasized by warbug and Christiam by showing that it is a component of codehydrogenase.

### **Experimental :-**

The composition of the medium employed was as follows

Sucrose	:	720 .00 g (15%)
NH <sub>4</sub> NO <sub>3</sub>	:	12.00 +0.5g
MgSO <sub>4</sub> 7H <sub>2</sub> O	:	1.20G+.5G
KH <sub>2</sub> PO <sub>4</sub>	:	2.40 liters

The PH of medium was adjusted by adding requisite amount of Kcl-Hcl buffer solution. The PH was also ascertained by a PH metre. The volume of the medium was noted and it was divided into 48 equal parts. Each part was taken in a separate 250ml flat bottom formator flask. These formator flask where then arranged in three sets, each comprising of fifteen

fermentor flasks. The remaining three fermentor flasks were kept as a controls. Each set was re-arranged in five sub-sets, each compressing of three fermentor flask.

Now M/1000 solution of nicotinic acid was prepared and 1 ml, 2ml and 3ml of solution were added in the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> sub-sets of all the three sets of the flask respectively. Similarly 4ml and 5 ml of the solution were added to the 4<sup>th</sup> and 5<sup>th</sup> sub-sets respectively. The control flask contained no nicotinic acid.

Now the total volume in each fermentor flask was made up to 100ml by adding requisite amount of distilled water. The molar concentration of nicotinic acid in the first, second, third, fourth and fifth subject were approximately given below :-

$$A \times 10^{-x} \text{ M}$$
$$1.0 \times 10^{-5} \text{ M}$$
$$2.0 \times 10^{-5} \text{ M}$$
$$3.0 \times 10^{-5} \text{ M}$$
$$4.0 \times 10^{-5} \text{ M}$$
$$5.0 \times 10^{-5} \text{ M}$$

Where A = Amount of nicotinic acid in ml i.e. ....to 5.0 ml.

X = Molarity of the nicotinic acid.

The above fermentor flasks were then plugged with cotton and sterilized, cooled, inoculated with a definite quantity of the India Suspension A. Clavatus-24. They were then incubated at 30 °C in an incubator and analysed after 5, 10 and 15 days for citric acid formed and sugar left unfementated.

The influence of nicotinic acid on the growth of A Clavatus-24 on the production of Citric Acid

**Table 1**

Concentration of nicotinic acid	Growth of the mold g/100 ml			Yield of Citric Acid g/100 ml			Sugar left g/100 ml		
	5	10	15	5	10	15	5	10	15
A x 10 <sup>-5</sup> M	5	10	15	5	10	15	5	10	15
1.0 x 10 <sup>-5</sup> M	1.1510	1.8794	2.9638	2.3015	3.2316	1.5231	9.6958	2.6637	1.5120
2.0 x 10 <sup>-5</sup> M	1.1625	1.8736	3.005	2.0316	2.956	1.6135	9.6932	2.6635	1.5015
3.0 x 10 <sup>-5</sup> M	1.2965	2.2012	3.0615	2.7139	2.5676	1.7356	9.7132	2.4120	1.9216
4.0 x 10 <sup>-5</sup> M	1.2769	2.0553	2.9576	2.5837	3.6353	2.1215	7.7385	2.4032	1.8973
5.0 x 10 <sup>-5</sup> M	1.2634	2.0049	2.8650	1.3750	2.0176	0.8153	9.952	3.2547	2.3995
Control	1.7524	2.7358	3.2927	1.1805	3.4569	5.0193	12.5296	7.4128	4.3386

Each value represents means of three trials  
 Experimental deviation (+) 1.5 to 3.5

**Discussion and Result :-**

The data given in the above table -1 indicates that the growth of the mold increases with increase in the concentration of nicotinic acid . The maximum growth was obtained at 3.0 x10<sup>-35</sup> M concentration. The growth was found to decrease gradually. It was further observed that the maximum amounts of growth obtained at different incubation periods were found to be lower than very insignificant on the growth.

It is usually observed that the yield of citric acid increases with the increase of incubation period, but in the present investigation.

Citric acid after 10 days off incubation was found to decrease. it was also observed that the influence of nicotinic acid on the production of citric acid was not increasing because of the fact that the maximum yield of

critic acid obtained in 5 and 10 days of incubation where not significantly better than that in the the controls and with 15 days of of incubation the maximum yeld was ever much lower that in the control. It appear in the influence of nicotinic acid deactivates and the enzyme system there by reducing the activity of A .Clacatus-24

So far the consumption of sugar was concerned it was found that with 5 day of incubatinalthe rate of consumption was slow, but it was rapid with 10 and 15 days of incubation. The consumption of sugar at 10 and 15 days incubation also did not correspond with production of citric acid.

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