Indian J. mycol Res. 18(2), 83—86, (1980)

EFFECT OF SOME NUTRIENTS ON GROWTH OF *VOLVARIELLA DIPLASIA*

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Necessary experiments have been done to find out the effect of different carbon and nitrogen sources on growth and yield of protein by mycelium of *V. diplasia*. Glucose is the best carbon source for growth. Starch is the best carbon source for the yield of protein. Among the nitrogen sources, potassium nitrate is the best for growth and yield of protein by the mycelium of the test fungus.

INTRODUCTION

Carbon and nitrogen play important roles in growth of any fungi. It has been claimed that the flavour of the mushroom mycelium is conditioned by the nature and amount of carbon sources. Fungi have been reported to utilize a wide range of carbon sources and as such there is no universal choice (Usef and Magid, 1967 ; Furuta and Yoichiro, 1970 ; Safari and Garibora, 1975). Similarly fungi have also been reported to be able to utilize wide range of inorganic and organic nitrogen (Usef and Magid, 1967 ; Furuta and Yoichiro, 1970 ; Luppi et al. 1974 ; Safari and Garibora, 1975).

The present investigation was undertaken to determine the effects of different carbon and nitrogen sources on the growth and mycelial protein content of *Volvariella diplasia* in a synthetic liquid medium.

MATERIALS AND METHODS

The tissue culture of *V. diplasia* was prepared from a freshly collected basidiocarp and used in the present investigation. Glucose caesin hydrolysate

medium (Lilly and Barnett, 1951) was used as the basal medium. For the carbon experiment, D (±) glucose, D (±) xylose, D (—) fructose, L (—) rhamnose, maltose, sucrose. starch, sodium citrate and sodium acetate were used as 20 g/l. For nitrogen experiment, ammonium nitrate, potassium nitrate, sodium nitrate, DL-alanine, L-aspartic acid, L-glutamic acid, L-asparagine, lysine, arginine and teucine were used as 2 g/l. The medium without any source of carbon or nitrogen served as control for the carbon and nitrogen respectively. The other experimental procedures have been described in Sur and Samajpati (1980).

RESULTS AND DISCUSSION

The data obtained on the effect of different carbon and nitrogen sources on growth and yield of protein by mycelium of *V. diplasia* are given in Tables 1 and 2.

Table 1. *Data (mean)* showing the effect of carbon sources on mycelial growth (g/l) and yield of protein (%) by the mycelium of* V. diplasia *at 15 days submerged growth*

Sources of carbon	Dry wt. of mycelium (g/l)	Protein content (%)
D (±) Glucose	1·762±0·62	17·16±1·24
D (±) Xylose	1·310±0·21	12.78±1·30
D (—) Fructose	1·461±0·40	24·78±1·24
L (—) Rhamnose	1·216±0·33	14·16±1·26
Maltose	1·310±0·28	16·16±1·24
Sucrose	1·610±0·26	17·36±1·24
Starch (soluble)	1·360±0·28	25·62±1·80
Sodium acetate	0·916±0·32	11·76±1·76
Sodium citrate	0·976±0·36	11·36±1·62
Control (No carbon source)	0·860±0·32	11·00±1·40

*Date are average of five separate determinations under identical conditions.

Table 2. *Data (mean) showing the effect of different nitrogen sources on the mycelial growth (g/l) and yield of protein (%) by the mycelium of* V. diplasia *at 15 days of submerged growth*

Source of Nitrogen	Dry wt. of mycelium (g/l)	Protein content (%)
Ammonium nitrate	1·36±0·38	20·78±1·18
Potassium nitrate	2·36±0·36	25·96±1·40
Sodium nitrate	2·11±0·28	20·16±1·28
Glycine	1·30±0·42	18·16±1·12
DL-alanine	1·36±0·41	16·30±1 20
L-aspartic acid	1·42±0·32	17·10±1·40
L-glutamic acid	1·57±0·31	16·30±1·26
L-asparagin	1·62±0·31	17·46±1·38
Lysine	1·12±0·20	15 16±1·38
Arginine	0·98±0·20	10·72±1·26
Laucine	1·12±0 36	14·60±1·18
Control	0·632±0·24	9·17±1·26

*Data are average of five seperate determinations under identical conditions.

Thy data in Table 1 show that glucose is the best source of carbon for growth which is closely followed by sucrose, fructose, starch, maltose and xylose. But the test fungus could not utilise properly sodium acetate and sodium citrate for its vegetative growth. Starch is the best source of carbon for yield of protein which is closely followed by fructose, sucrose and glucose.

The data in Table 2 reveal that the test fugus could utilise inorganic sources of nitrogen more efficiently than those of the organic. Among the inorganic sources potassium nitrate is the best source for growth and yield of protein by the mycelium of the fungus which is closely followed by sodium nitrate aud ammonium nitrate. Of the organic sources, asparagine is the best source for growth which is followed by glutamic acid, aspartic acid, alanine and glycine but the fungus could not utilise arginine efficiently. Glycine is the best source for yield of protein and is followed by asparagine and aspartic acid.

The present findings support the view of Usef and Magid (1967) in that sodium acetate and sodium citrate are not favoured as carbon sources by this fungus.

But in case of nitrogen, the present findings differ with Usef and Magid (1967). But the present findings support the view of Safari and Garibora (1975) in asparagine being one of the best organic sources for this fungus.

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