PLEUROTUS SAJOR-CAJU (FR.) SINGER, A PROTEIN RICH NITROGEN FIXING MUSHROOM FUNGUS

IN a search for new sources of protein food to improve the nutritional quality of our diet we came across an edible mushroom in *Pleurotus sajor-caju* (Fr.) Singer which has been reported to produce sporophores in the greenhouse under artificial culture[1]. The fungus has been found to grow readily on farm wastes, producing sporophores and in the process fixing atmospheric nitrogen to enrich the substratum. The data in support of this are presented in this paper.

Pure cultures of *Pleurotus sajor-caju* obtained from Dr. C. L. Jandaik, Indian Agricultural Research Institute, New Delhi, was used in these studies. Fresh isolates of the fungus were obtained from fresh sporophores, by the tissue culture method and were maintained on oatmeal agar slants. For *in vitro* study the fungus was grown on synthetic media[2], without nitrogen source. Analar grade chemicals and double distilled water were used to avoid nitrogen in the medium. For spawning beds maize grain spawn[3] was used. A mixture of paddy straw, wheat straw and hulled maize cobs in the ratio of 1 : 1 : 1 (W/W) was used as a substrate (bed) for the production of the mushroom. The substrate was pre-soaked for 12 hr in water and spread in trays (60 × 45 × 15 cm) and spawned with about 500 g of grain spawn. Estimation of protein[4] in the sporophores and the spawned substrate was carried out at periodical intervals.

The growth *in vitro* and protein content of *P. sajor-caju* estimated at periodical intervals are presented in Table I. The fungus not only put forth good growth in the nitrogen-free medium but also its nitrogen fixing ability was indicated by increased N-content of the mycelium over a period of five weeks. Nitrogen fixation by higher fungi has been reported by Ginterova[5].

TABLE I

In vitro *growth and protein content of* Pleurotus sajor-caju *in nitrogen-free medium*

Incubation period	Mycelial dry wt. in mg/ 100 ml	% mycelial nitrogen	% mycelial protein	% N in the liquid medium
1st week after inoculation	43	2·1	13·5	..
2nd week	80	2·28	14·3	..
3rd week	107	2·75	17·2	0·09
4th week	120	2·81	17·6	0·12
5th week	130	2·91	18·2	0·19

The nitrogen content of the bed, inocculated with *P. sajor-caju* at different intervals, is presented in Table II. There is a steady increase in the nitrogen content of the substrate upto 30 days of spawning

TABLE II

Nitrogen content of the bed and yield data of Pleurotus sajor-caju
(average of four replications)

Particulars	% nitrogen	% protein	Date of harvest of mushroom	Yield in g/bed of 3 kg
Uninoculated bed	0·25	1·56	..	..
Inoculated bed	0·31	1·93	..	..
5 days after inoculation	0·97	6·06	..	..
10 days after inoculation	2·17	13·56	..	..
20 days after inoculation	2·94	18·37	23rd day 32nd day	320 120
30 days after inoculation	2·92	18·25	39th day	100
40 days after inoculation	2·53	15·81	45th day 55th day	105 250
50 days after inoculation	2·32	14·50	Nil	..
60 days after inoculation	2·23	13·93	Nil	..
			Total mushroom yield	895

Protein content of sporophores 34·5%

Total N in the beginning	:	7·44 g
N fixed through sporophore	:	63·36 g
N fixed in the substratum	:	46·08 g
Total N fixed during 60 days	:	109·44 g

after which there is a decline. The increased protein content of the substratum indicates positively the N-fixing capacity of the fungus. Sporophores appeared from 20–25 days after inoculation of the bed and contained 34·5% protein, on dry weight basis. After the harvest of sporophores, the substrate contained protein, varying from 15 to 18%. The sporophores are tasty and delicious as a protein-rich food and the substrate with enriched nitrogen could be used as manure to crop fields. *P. sajor-caju* has also been successfully raised on the stem bits of bhendi, brinjal and papaya, mixed in equal proportions with paddy straw and wheat straw.

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