

Minerals composition of mushroom (*Pleurotus* species)

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SUMMARY

Three *Pleurotus* species namely *Pleurotus sajor-caju*, *Pleurotus florida* and *Pleurotus ostreatus* were evaluated for their mineral (Na, K, P, Ca, Fe) content when cultivated on different substrates (soybean, paddy, wheat straw and their combination in 1:1 proportions). *Pleurotus ostreatus* showed maximum Na (318 mg/100g) K (2450 mg/100g) and P (935 mg/100g) content when grown on soybean straw, whereas maximum Fe (14.30 mg/100gm content was found when grown on combination of soybean +paddy straw. *Pleurotus sajor-caju* was found to give maximum Ca (350 mg/100g) content when grown on combination of soybean +paddy straw.

Key words : *Pleurotus sajor-caju*, *Pleurotus ostreatus*, *Pleurotus florida*, Minerals

Consumption of mushroom have been known from many years, as they are important for both nutritive and medicinal values (Bonatti *et al.*, 2004; Cheung and Cheung, 2005). The edible mushroom species are highly nutritious and their nutritional value comparing favorably with that of milk, eggs and meat (Gruen and Wong, 1982; Suzuki and Oshima, 1976; Zakhary *et al.*, 1983). Mushrooms are the rich source of minerals (Jiskani, 2001) and provide valuable nutrients to the diet in the form of proteins, vitamins and salts of phosphates, potassium, sodium, sulphur, calcium, magnesium, iron, zinc chlorides, silicates, molybdenum and vanadium. Singh *et al.* (2003) reported 4.75 to 21.00% ash (minerals) in different mushroom species. Presence of high potassium: sodium ratio makes the mushroom an ideal food for person suffering from hypertension and heart diseases (Rai *et al.*, 1998; Mandhare *et al.*, 2003). Huseyin *et al.* (2009) estimated the macronutrients (mg/g d.w.) as Ca (0.17-8.80), K (12.6-29.1), Na (0.03 – 4.85), P (0.64-4.49) and micronutrient as Fe (50.1-842 mg/kg. d.w. from wild grown edible mushroom species.

Necla (2007) reported average mineral value of *Pleurotus* sp. (mg/kg wet basis) were Zn (11.18 - 9.31), Fe (14.80 - 7.94), P (998.47 - 716.31), Ca (81.16 - 23.66), K (2225-2687) and Na (750.77 - 773.67). The present study was conducted to study the effect of different substrates on mineral content of *Pleurotus* species.

MATERIALS AND METHODS

Samples:

The *Pleurotus* species viz., *Pleurotus sajor-caju*, *Pleurotus florida* and *Pleurotus ostreatus* were grown on different substrates viz., soybean, paddy, wheat straw and their combinations in 1:1 proportions. The samples were collected from three successive harvesting (pickings), dehydrated in cabinet dryer and ground to fine powder, packed in bottles and stored in refrigerator till used for analysis.

Mineral analysis:

The samples were digested in tri-acid mixture [(HNO₃: H₂SO₄ and HClO₄) in 10:1:4 ratio]. For digestion 1 gm of powdered samples of dehydrated mushrooms from different harvesting were taken in 100 ml conical flask, 5 ml of concentrated HNO₃ was added to it and kept overnight. On next day, 10ml of tri-acid mixture was added and digested on hot plate as described by Piper (1966). After digestion, the material was filtered and volume was made to 100 ml. This acid digest was used for estimation of minerals viz., sodium, potassium, phosphorus, calcium and iron (Jackson, 1958). Sodium and potassium content of mushroom samples were estimated by using flame photometer (Chapman and Pratt, 1961). Calcium content was estimated by Versenate titration method (Black, 1965). Iron content was estimated by using spectrophotometer at 480nm. (Ranganna, 1995). Phosphorus content was determined by Vanadomolybdate yellow colour method as described by Piper (1966). The recorded data in the present work was subjected to statistical analysis as per the procedure recommended by Panse and Sukhatme (1967).

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Table 1 : Effect of different substrates on mineral content (mg /100 g D.W.) of different *Pleurotus* sp.

Substrate	Sodium (Na)			Potassium (K)			Phosphorous (P)			Calcium (Ca)			Iron (Fe)		
	P.sc.	P.f.	P.o.	P.sc.	P.f.	P.o.	P.sc.	P.f.	P.o.	P.sc.	P.f.	P.o.	P.sc.	P.f.	P.o.
Soybean straw	260	160	318	2380	1915	2450	890	850	935	340	230	300	12.80	12.10	13.10
Paddy straw	220	150	255	2300	2068	2225	785	880	890	330	260	295	12.18	12.30	12.50
Wheat straw	250	155	260	2520	1920	1920	870	885	820	325	250	280	12.25	12.00	13.00
Soybean +Paddy straw	230	180	282	2285	2110	2300	830	905	900	350	235	320	11.80	10.80	14.30
Soybean +wheat straw	236	132	235	2082	2080	2160	700	870	755	300	215	245	10.90	10.68	10.38
Wheat + Paddy straw	225	128	238	2340	1950	2010	735	845	790	310	220	265	12.20	9.70	11.80
S.E. ±	4.30	4.08	6.40	12.58	7.22	8.74	15.62	7.65	14.85	9.75	4.30	8.10	0.18	0.43	0.62
C.D. (P=0.05)	13.52	12.20	20.15	38.07	21.82	26.53	49.18	24.10	46.76	29.62	13.49	25.32	0.54	1.30	2.04

RESULTS AND DISCUSSION

Mineral content of *Pleurotus species* differed significantly when grown on different substrates (Table 1).

Sodium content of *Pleurotus sajor-caju* (260 mg/100g), *Pleurotus ostreatus* (318 mg/100gm) were found maximum when cultivated on soybean straw, whereas the sodium content of *Pleurotus florida* (180 mg/100g) was found maximum when cultivated on the combination of soybean + paddy straw. These results were usually in accordance with the literature (Mandhare *et al.*, 2003). The potassium content of *Pleurotus sajor-caju* was (2520 mg/100g) maximum when cultivated on wheat straw, it was found maximum in *Pleurotus florida* (2110 mg/100g) when cultivated on the combination of soybean + paddy straw, whereas in case of *pleaurtous ostreatus*, potassium content was found maximum (2450 mg/100g) when cultivated on soybean straw. These results were confirmed with the findings of Bisaria *et al.* (1987), Necla (2007). Phosphorus content of *Pleurotus sajor-caju* was significantly highest (905 mg/100g) when cultivated on combination of soybean + paddy straw. The phosphorus content of *pleurotus florida* was found maximum (870 mg/100g) when grown on wheat straw whereas in case of *Pleurotus ostratus* phosphorus content was highest (935 mg/ 100 g) when grown on soyabean straw. Phosphorous content determined in this research are

generally in accordance with the previous studies (Necla, 2007).

Calcium content of *Pleurotus sajor-caju* and *Pleurotus ostreatus* were found significantly higher (350 and 320 mg/100g) when grown on combination of soybean + paddy straw, whereas the calcium content of *Pleurotus florida* was found higher (260 mg/ 100g) when grow on paddy straw. The results are in accordance with findings of Mandhare *et al.* (2003).

The iron content of *Pleurotus sajor-caju* was significantly highest (12.80 mg/100g) when cultivated on soybean straw. The iron content of *Pleurotus florida* was higher (12.30 mg/100g) when grown on paddy straw, where as it was found maximum in *Pleurotus ostreatus* when cultivated in combination of soybean + paddy straw (14.30 mg/100g).

The obtained iron values in the present study are generally in accordance with the values reported by Rathore and Thakare (2004), Kikuchi *et al.* (1984).

From the result it could be concluded that the mineral content of different *Pleurotus species* differed when cultivated on different substrates. *Pleurotus species* observed to be rich in minerals and can provide essential nutrients to the diet. Due to high K/Na ratio, *Pleurotus species* were recommended to be the best food item for the person suffering from hypertension and heart diseases.

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