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Short Note

Selection of high yielding strains of *Pleurotus ostreatus* from wild strains

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Pleurotus species due to gymnocarpous sporophores release spores luxuriantly in atmosphere. These spores on inhalation cause allergic reactions as hay fever and farmer's lung disease. Attempts have been made for production of spore less/ low spored strains by several workers like Eger (1974) but with limited success. The present investigation was an attempt to cross the wild strain of *P. ostreatus* for better qualitative and quantitative characters.

Efforts were made to improve the wild strain of *P. ostreatus* collected from the natural habitat in Palampur area using conventional breeding technique as described by Eger and Eden (1976). Initially, eleven monokaryotic mycelia from single fruiting bodies of the wild strains were isolated using single spore isolation method. Two spores were inoculated in each plate at 2cm distance (dual culture technique) in sterilized Petri plates containing potato dextrose agar (PDA) medium. The plates were incubated at 22±2 °C for 7 days after which the point of contact (meld zone) was observed. The meld zone morphology of fluffiness, thick barrages were considered as compatible dikaryons (hybrids) and the clear demarcation of the contact zone (meld) proves incompatibility. Based on the compatibility, different monospores were mated as per the method of Pandey and Tewari (2004). The wild as well as hybrid strains were selected for cultivation on sterilized paddy straw as a substrate and inoculated with 2.5 per cent of wheat grain spawn in poly bags (Eswaran *et al.*, 1998). The fruit bodies were assessed for colour, texture, yield, biological efficiency and sporulation on wet weight basis. Based upon the morphology and the visual observation of spore print, sporophores were classified into heavy, average, low sporulating and spore-less as per the criteria proposed by Jose *et al.* (2002). Data were analysed using standard statistical methods.

A large number of single spore isolates of selected strain of *P. ostreatus* were made and as many as fifty five crosses were attempted. Amongst them only fifteen crosses were compatible. The data on compatible and incompatible crosses is presented in table 1.

Table 1. Mating reaction of monokaryons of wild strain of *P. ostreatus*

Single spores	1	2	3	4	5	6	7	8	9	10	11	Total compatible crosses
1		-	+	-	-	-	+	-	-	+	-	3
2			+	-	+	-	-	-	-	-	+	3
3				+	-	+	+	+	+	+	-	6
4					+	+	-	-	-	-	-	2
5						-	-	-	-	-	-	0
6							-	-	-	-	-	0
7								-	-	-	+	1
8									-	-	-	0
9										-	-	0
10											-	0
11											-	0

+ Compatible cross - Incompatible cross

Based on the morphology and observations of spore print seven hybrids were classified as heavy sporulating type resembling the parent wild strains, seven as average sporulating types and two as low sporulating type. Completely spore less strain was not found. Data on sporophores morphology and spore production are being presented in Table 2. Similar observations were recoded on *P. florida* by Pandey and Tewari (2004). Hybrid strain 3x8 recorded statistically superior qualitative and quantitative characters with respect to wild parent strain. It was smooth textured, off white in colour, low spored and possessed maximum biological efficiency to the tune of 99.3 per cent. It retained its colour during storage. Three other hybrid strains *viz.*, 3x10, 3x7 and 1x7 which were also statistically superior over wild strains and were low to average spored, smooth textured and had biological efficiency varying from 85 to 88 per cent being comparable to wild strains.

Table 2. Qualitative and quantitative characters of improved and wild strain of *P. ostreatus*

Strain	Colour	Texture	Yield (g /500g dry substrate)	Biological efficiency (%)	Sporulation
1x3	Off-white	Smooth	399.3	79.9	***
1x7	Buff	Hairy	430.0	86.0	***
1x10	Creamish	Rough	409.3	81.9	**
2x3	Off-white	Smooth	414.0	82.8	**
2x5	Creamish	Rough	379.3	75.9	**
2x11	Pure white	Smooth	416.3	83.3	***
3x4	Buff	Smooth	419.3	83.9	***
3x6	Light brown	Hairy	391.7	78.3	*
3x7	Off-white	Smooth	429.3	85.9	**
3x8	Off-white	Smooth	496.3	99.3	*
3x9	Creamish	Leathery	395.0	79.0	**
3x10	Off-white	Smooth	494.3	87.9	**
4x5	Dull brown	Leathery	399.3	79.9	***
4x6	Buff	Hairy	405.0	81.0	***
7x11	Creamish	Smooth	414.3	82.9	**
Wild	Off-white	Smooth	415.0	83.0	***
CD (P=0.05)			33.30		

* Low spored ** Average spored *** Heavy spored

Strain 3x6, though, was low spored and had biological efficiency comparable to wild parents but its colour was light brown and texture was hairy which is not preferred over cream or off-white colour. As has been discussed earlier, spores of *Pleurotus* cause severe allergies, which is the main limitation for commercial expansion of this agro-industry. Present investigations were undertaken to achieve the goal of developing commercially viable low spored or average spored progenies. The crossings yielded a segregation of high, average and low sporulating strains. Earlier, Pandey and Tewari, (2004) and Perisamy and Natrajan (2002) have reported the production of low to average spored strains of various *Pleurotus* species.

Based on the compatibility, fifteen diakaryotic strains were selected for cultivation and their biological efficiency was analysed. Among them, the strains namely, 3x8, 3x10, 1x7 and 3x7 were found to be superior over others and resulted in higher biological efficiency and low spore count. Strain 3x8 was low spored and possessed maximum biological efficiency (99.3%). Strain 3x6 was also low spored but its yield was comparatively lower than parent strain and other hybrid strains. No spore less strain was encountered.

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