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REUSE OF MUSHROOM WASTE (*AGARICUS BISPOROUS*) AS A BIOSORBENT OF SYNTHETIC DYES IN TEXTILE INDUSTRIAL EFFLUENT

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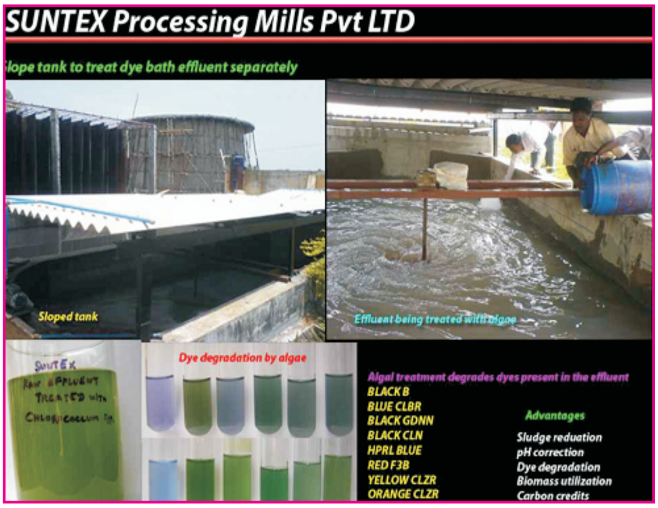

ABSTRACT :
Agaricus bisporous button mushroom is an edible mushroom cultivated on large scale. The cultivation of A. bisporus involves the production of tones of spent A. bisporus substrate (SAS). It is an urgent need to reuse the SAS. Present study is aimed to, recycle the SAS for the sorption of synthetic dyes from effluent of textile industry and study the use of treated water for irrigation. Hence the irrigation purpose water and aqueous solution of Methylene blue, Basic fuchsin and Crystal violet were passed through the SAS. To check the possibility of use of treated water for the purpose of irrigation, the seed germination assay was carried out. Seeds soaked in dye solution did not germinate where germination of seeds were observed in the treated water.The result of present study suggests that spent Agaricusbisporus substrate can be used to treat the effluent containing synthetic dyes.

KEYWORDS: *A. bisporus, biosorbent, seed germination assay, spent A. bisporus substrate.*

INTRODUCTION-

Textile industrial effluent contains synthetic dyes which make the water toxic for any use like irrigation and other various methods of filtration and purification of effluent are extensively used by the textile industries. The disadvantage of these techniques is its coast and efficiency. To overcome these problems and make the water purification cheap, new eco-friendly methods should be used. Use of SAS for the same purpose can be a better substitute to the expensive methods. SAS is a cheap waste generated through the production of A. bisporus mushroom, also it absorbs 95% of some textile dyes from effluent.

MATERIAL AND METHOD-

SAS collection- Spent Agaricus bisporus substrate was collected fromTirupati Balaji Agro Products Pvt. Ltd., Waghalwadi, Baramati, Pune, Maharastra, India.

Sundried SAS were sundried for 2 days and filled in a plastic coloumn.

Synthetic dye solution 250mg/ml aqueous solution of Methylene blue, Basic fuchsin and Crystal violet were prepared. Λ max of the dyes checked.

To determine the ability of SAS to absorb dyes, solution of dyes were passed through the column of SAS and filtrate were collected. Absorbance of filtrate were checked using respective Λmax

To check the purity and applicability of filtered synthetic dyes, seed germination assay was performed. Pitcher seeds were soaked in water passed through SAS column as well as dye solution passed through SAS column.

Result –

Sun dried SAS absorbs Methylene blue and Basic Fuchsin.

Optical Density of solution of synthetic dye is considered as initial optical density. After passing the solution through SAS again optical density was measured and % dye absorption was calculated.

Sr. No.	Dye	% Dye absorption
1	Methylene Blue	96.51
2	Crystal Violet	9.80
3	Basic Fuchsin	50.9

To cheak the efficiency of water for further use, seed germination assay was carried out.

Sr. No.	Dye	No. Of seeds treated	Seeds Germinated in		
			H_2O	Std. dye	Dye passed through SAS
1	Methylene Blue	10	9	0	7
2	Crystal Violet	10	10	0	Nil
3	Basic Fuchsin	10	8	0	5

DISCUSSION –

In the present study new property of SAS, to absorb synthetic dyes, has been investigated. From colourimetric study it is observed that SAS has significant absorption activity. % dye absoption shows that the Methylene blue and Basic fuchsin is absorbed significantly. Absorption of crystal violet is less.

Seed germination assay proves the absorption of dye by SAS because as the % absorption increases the numbers of seeds germinated are also increased.

However further study is necessary in which the various concentrations of dyes can be used and efficiency of SAS to absorb the dye can be checked.

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