The competition between 2 fungi in same sugar (food) source can lead to change ph...

Health & Medicine

MICROBIOLOGY ASSIGNMENT: THE COMPETITION BETWEEN TWO FUNGI IN SAME SUGAR SOURCE CAN LEAD TO CHANGE IN PH AND COLOUR The change in colour to purple in the first experiment must have been as a result of sample or media contamination. This is because a detailed repeat of the culture media experiment from 100 plate of Scytalidium Ganodermopthorum fungus and 10 negative control plates gives a gradual change in colour from colourless to yellow and olive green but you does not achieve the purple change.

Methodology:

S Ganodermopthorum can be found wildly in most tropical trees. To extract it you have to take precisely cut wood from a chosen tree of your choice. Since different species of fungus can be found in a single tree, we have to extract the required species through inoculation of the wood samples taken.

1. Firstly inoculate the wood samples in wood agar petri dishes as mention be Robinson etal in International Wood Products Journal, vol. 5, no. 2, pp. 103–107. After proper extraction of Scytalidium Ganodermopthorum fungi species from wood, petri dishes of the culture are prepared.

2. The second step involves liquid culture growth, the fungus is grown on malt media amended with white rotted maple prepared in half-pint Mason jars with plastic screw lids. The petri dishes are sterilized via autoclaving before use.

3. After sterilization fill the dishes with 50 mL of autoclaved liquid media (2% malt in deionised water) according to Robinson etal,“ Ability of three yellow pigment producing fungi to colour wood under controlled conditions,” International Wood Products Journal, vol. 5, no. 2, pp. 103–107,

2014.

4. Inoculate each petri dish with five 6 mm plugs from the 100 agar plates of actively growing fungal culture and the 10 negative control plates

5. Incubate the liquid cultures on an open shelf at room temperature for the next twenty two weeks. Over this period the colour measurements were recorded on a Konica Minolta CR-5 chroma meter for each flask of media before use, with output in the CIE L*a*b* colour space.

6. Filter 3 plate of the media using a Whatman Cat. No. 1002150 filter sheet after every 7 days. The pigments collected after filtrations are then solubilised in dichloromethane and standardized based upon their colours using the colour reading machine for distinguished and precise results every 7 days. For the green colour obtained from the readings in the machine S. ganodermophthorum L* = 87. 04, a* = −0. 54, b* = 22. 21. This is a perfect pitch green colour and any pigmentation close to this will be olive green as shown by the media from the 100 plates. Those from the 10 negative plates will retain their colour.

Under natural conditions once the growth of a fungal colony is established, or when supplies of vital nutrients become depleted, parts of the mycelium may switch biochemical activity to pathways of secondary metabolism. Rather than producing new fungal building materials this gives rise to other compounds (secondary metabolites), according to Dura´n etal, Ecological-friendly pigments from fungi. Crit. ReV. Food Sci. Nutr. 42, 2002; 1: 53-66. This process leads to the generation of fungal pigments. This suggests that one species of fungi may contain a mixture of several different pigments hence the cases of yellow and olive green pigments noticed. This also

suggests that the purple colour from the first media might have been as a result of biochemical activities of the S. ganodermophthorum due to depletion of vital nutrients in the culture media.

If the changes in colour was because cross contamination of Scytalidium Ganodermopthorum species with Scytalidium Cuboduim , then this resulted from over depletion of vital nutrients in the culture media which resulted into rise of secondary metabolites. Sigler, etal. Taxonomy of Malbranchea and some other Hyphomycetes with arthroconidia. Mycotaxon 1976, 4, 349–488, says, that the competition between 2 fungi cause change in PH, O2 and CO2, since nutrients that are present in the culture are quickly depleted leading to excess or increased amounts of metabolic wastes that adversely affect the PH, O2 and CO2 of the culture media. This leads to an imbalance in their required or expected quantities in the media, resulting to too much acidity, alkalinity as the chemicals react or eventually the death of one of the fungus species or all of them.

The death of one fungus can cause the release of compound change the PH of medium from acidic to alkaline. This is because the death of one fungus reduces the excretion of metabolic waste and its brake down by the surviving fungus replenishes the culture media ensuring alkalinity is maintained.

References:

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