

# Correlation between the sources of carbohydrate assimilation and spoilage of food items by pathogenic and non-pathogenic yeast

MUKTA SINGH, KARUNA SINGH, DIVYA AND ARADHANA YADAV

Biologically active compounds are extra nutritional constituents that typically occur in small quantities in foods, vary widely in chemical structure and beneficially affect health and well-being. Nutritional yeast is the powerhouse of nutrients and it's a great addition to healthy life style especially for the vegetarians. Nutritional yeast is deactivated yeast, often a strain of *Saccharomyces cerevisiae*, which is sold commercially as a food product. Some of the sub species of *Cryptococcus neoformans* are pathogenic for the human immune system. Yeasts for obtaining energy undergo assimilation reaction *i.e.* break down of carbohydrate into its monomeric unit by various enzymatic activities produced by various yeasts. In the present study carbohydrate assimilation was studied by using different food products having pathogenic and non-pathogenic yeasts. All the 17 isolates of pathogenic yeast were used and two sub species of *S. cerevisiae* and *Rhodotorulla* which were isolated from yeast powder and curd, respectively. It was seen by the use of spectrophotometer *i.e.* if the isolate has greater efficiency to assimilate food products then that food product having specific carbohydrate will be easily spoiled by the yeast. It was revealed by results that all the pathogenic yeast has high absorbance efficiency for fructose. It has been statistically proved 't' calculated value (6.68) is greater than value of tabulated value (2.05) at 5% level of significant. The Rhodotourla obtained from curd sample, have high absorbance value (0.83) at is more favourable in food fermentation when food ingredients contains honey as energy. In milk proper absorbance value not obtained, indicating that Rhodotourla can be utilized in fermentation but not too much extent.

**Key Words :** Yeast, Carbohydrates, Assimilation, Pathogenic, Non pathogenic

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Nutrition is the selection of food and preparation of food and their ingestion to be assimilated by the body. By practicing a healthy diet, many of the know health issues can be avoided. Biologically active compounds are extra

nutritional constituents that typically occur in small quantities in foods widely in chemical structure and beneficially affect health and wellbeing. Yeast and fungi grows as single cells producing daughter cells either by budding or by binary fission. Yeast grow stypically in moist environments where there is a plentiful supply of simple, soluble nutrients such as sugars and amino acids. For this reason they are common on leaf and fruit surfaces, on roots and in various type of food.

The core challenge for all organisms is the need to procure sufficient nutrients to generate both energy and

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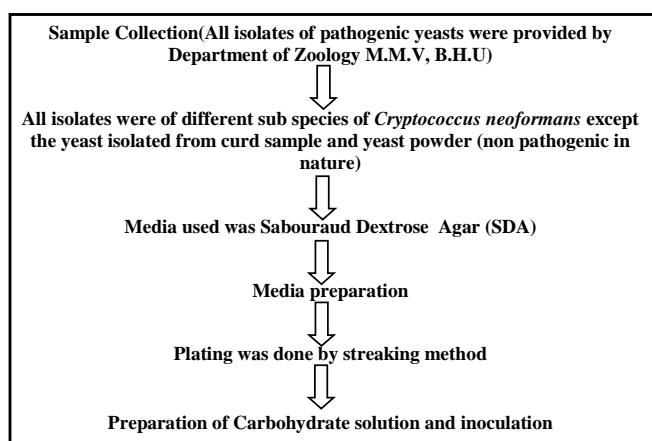
necessary macro-molecules to drive cellular respiration. The potential for rapid changes in nutrient availability is particularly acute for micro-organisms and most have respond by maintaining the ability to use wide variety of compounds as primary source of carbon, nitrogen, phosphorus and sulphur. At the same time cellular metabolism is turned to preferentially use nutrients that are efficiently assimilated.

Nutritional yeast is the powerhouse of nutrients and it's a great addition to healthy life style especially for the vegetarians. Nutritional yeast is deactivated yeast, often a strain of *Saccharomyces cerevisiae*, which is sold commercially as a food products. Some of the sub species of *Cryptococcus neoformans* are pathogenic for the human immune system. Yeasts for obtaining energy undergo assimilation reaction *i.e.* break down of carbohydrate into its monomeric unit by various enzymatic activities produced by various yeasts.

The material and method was processed under the following headings.

- Sample collection
- Media used
- Media preparation
- Plating
- Carbohydrates assimilation
  - Preparation of carbohydrates solution
  - Inoculation

The flow of work was as under :



Fructose assimilation was done and the optical density of isolate no.8 was possessing the maximum absorbance (0.56) at 405 nm which indicates that this isolate has greater efficiency to assimilate food products having fructose content , as a result such foods products can be easily spoiled by them. On other hand isolate number 14 having absorbance value 0.006 at 405nm posses least capacity to absorb fructose as compare to other isolates which indicates that it had least efficiency to assimilate food products containing fructose sugar and thus little harm occur to such food products.

Lactose assimilation was more in isolate 8 (optical density 4.41 at 405 nm). The results revealed that product containing milk sugar were frequently spoiled in presence of isolate no. 13 which was a pathogenic species of *Cryptococcus*.

Honey assimilation was seen more in isolate no. 5 as it had absorbance value of 1.14 at 405nm whereas isolate 17 had the least absorbance.

### Conclusion :

The study revealed that if fructose is involved in foods as carbon source for providing energy then isolate no. 8 of *Cryptococcus* species will spoil the food very easily.



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