"Optimization of fermentation parameters to produce wine from Dragon fruit sample using *Saccharomyces cerevisiae* spp"

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Abstract-

Dragon fruit grows at the *Hylocereus cactus*, additionally referred to as the Honolulu queen, whose vegetation most effective open at night. The plant is local to southern Mexico and Central America. Today, it's far grown all around the world. It is going via way of means of many names, such as pitaya, pitahaya, and strawberry pear. The maximum not unusual place sorts have brilliant purple pores and skin with inexperienced scales that resemble a dragon for this reason the name. The maximum extensively to be had range has white pulp with black seeds, alevin though a much less not unusual place kind with purple pulp and black seeds exists as well. Another range known as yellow dragon fruit has yellow pores and skin and white pulp with black seeds. This study targets to offer a top level view of the distinct species of *Saccharomyces cerevisiae*, specializing in their characteristics, taxonomic distribution and their useful function withinside the industry, particularly in terms of Dragon fruit wine manufacturing and products.

Key words- Dragon fruit sample , *Saccharomyces cerevisiae spp.* Sugar .

Introduction –

Dragon fruit (*Hylocerus undatus*), brought as a brand new crop in low rainfall region and rocky barren land, is gaining speedy reputation among farmers. It is a nutritious fruit with plenty of makes use of as pulp, which represent 70-80% of the ripe fruit. Dragon fruit is especially to be had in 3 versions viz., crimson pores and skin with white pulp (*Hylocereus undatus*), crimson pores and skin with crimson pulp (*Hylocereus monacanthus* formerly referred to as *H. polyrhizus*) and yellow pores and skin with white pulp (*Hylocereus megalanthus* formerly referred to as *Selenicereus megalanthus*). The redfleshed styles of dragon fruit are especially wealthy in antioxidants. It is understood to save you colon cancer, diabetes and neutralizes poisonous materials along with heavy metals; lessen ldl cholesterol and excessive blood pressure. It is wealthy in nutrition C, phosphorus and calcium. The flavour of the fruit resembles to kiwi fruit. Fruits are low in fats and wealthy in minerals with the most suitable Brix fee of 15-180Bx. It is extensively used as fruit salad in big name inns and restaurants. It may be processed to variety of commercial merchandise along with juice, jam, syrup, ice cream, yogurt, jelly, preserve, sweet and pastries. The crimson and crimson pulp of dragon fruit is used for extraction of herbal colours. The flower buds of dragon fruit are used to make soups or jumbled together salads. This bulletin gift the botanical characteristics; dietary and health; financial and social importance; cultural practices and financial evaluation of dragon fruit cultivation in India.

Botanical Speciality of dragon fruit Some of the botanical traits of the plant are referred to below.

• *Hylocereus undatus* is a mountain climbing vine cactus species of the own circle of relatives Cactaceae. It is is a quick growing, epiphytic or xerophytic.

• It is certainly considered one among 15 widely wide-spread *Hylocereus* species. While lots of those have decorative price due to their flowers, handiest 5 are essential as fruit producers.

• Common names such as `dragon fruit', 'pitaya' and 'pitahaya' are general terms, which encompass numerous species of columnar and mountain climbing cacti. They are regularly implemented to species aside from H. *undatus* too and commonly consult with the end result in preference to the plant.

• It is taken into consideration local to southern Mexico, the Pacific coast of Guatemala, Costa Rica, and El Salvador. It is now commercially cultivated and extensively disbursed during the tropics and a few temperate regions.

• Stems are triangular, three-sided, despite the fact that occasionally 4- or 5-sided, green, fleshy, jointed, many branched. Each stem phase has three flat wavy ribs and corneous margins can be spineless or have 1-three small spines.

• Stems scandent, creeping, sprawling or clambering, up to ten m long. Aerial roots, which can be capable of take in water, are produced on the bottom of stems and offer anchorage for stems on vertical surfaces.

• Flowers are 25-30 cm long, 15-17 cm wide, nocturnal, scented and hermaphroditic; however, a few cultivars are self-compatible. Dragon fruit contains several types of antioxidants. It is low sugar fruit but hazardous heath effect on human being so using for wine production.

Material & Methods

The dragon fruit', or '*pitaya*' and 'pitahaya' sample for dragon wine production were obtained from coastal region of Maharashtra .The freshly trapped dragon samples were collected in wash with water sterile .cutt into small pices crushed it prepaed the juice constration .juice sampling teste Ph of sample was determine at sampling sites using a portable Ph meter . to check juice acidity and suagr %

1)Sample collection:

Soil sample was collected from Sakharale Tal-Walwa ,Dist -Sangli, farming soil collected in sterile container (Daniel *et al*.2021).

2) Enrichment of sample:

soil sample was enriched by Malt glucose yeast and peptone Broth In 1week incubation period at a 30°©room temperature. .(Daniel *et al*.2021).

3) Isolation method:

Isolation of microorganisms from soil.it was along enriched sample and spread on MGYP Agar plates Agar plates and incubate at room temperature for 2 to 3 days. (W Scharf *et al*. 2013).

4.Selection of Microorganism –

In dragon fruit' sample near about 12-16.5% suagr is present in the from sucrose this sugar get fermentated into sacchromyces cervies and convert to alcohol. The selection of a good yeast strain having desirable properties is a prerequisite for the quality wine production (Degree, 1993).

5.Maintain Parameter –

Brix of toddy is 18-19^{0}bx ,ph is t dragon fruit' sample for wine production to maintain 4.0-4.5 and tempreture is 20-22^{0}c

6.Fermentation –

Carried out the fermentation with adding 5% ***Saccharomyces cerevisiae*** and at 20-22^{0}continuase monitring system. submerged fermentation were studied.

7. **Racking –**

Racking is the process of siphoning the wine into a new,clean barrel. Racking allows clarification and aids instabilization. Wine that is allowed to age on the lees oftendevelops "off-tastes". A racking hose or tubing is used and can be attached to a racking cone to make this task easier. The racking process is repeated several times during the aging of wine. Repeated racking produces the clarity required in wine, especially if it is aged in a barrel (Robinson, 2003).

8. **Ageing-**

The ageing of wine and its ability to potentially improve wine quality for its consumption, is one of the most important step after wine production (Robinson, 2006). The ratio of sugars, acids and phenolics to water is a key determination of how well a wine can be age.

9.Sensory evaluation

The sensory analysis of wine is an important parameter indetermining the quality of wines. It revolves around the taste, feel, aroma and bouquet of the aged wine.

8.Wine quality parameters –

1.Determination of sugar content –

The refractometer was used to determine sugar content of wine. The refractometer was thermostatic at 20^0c and calibrated with distilled water. Then the wine sample apply evenly onto the surface of the prism and the refractive index was read after 2 min. The sugar content was determined in each measurement was repeated twice. (Nikola *et al*.,2019)

2.Determination of pH -

pH is measured by using pH meter calibrated with pH 4 and pH 7.

3.Determination of specific gravity -

Weight of empty specific gravity bottle was taken with the help of electronic balance

$$specific\ gravity = \frac{A - B}{C - B}$$

Where,

A = weight in gm of specific gravity bottle with wine sample.

B = weight in gm of specific gravity bottle

C = weight in gm of specific gravity bottle with water.

5.Colour –

Colour of the

Fungal strain	S1

wine was determined by visual observations.

6.Aroma –

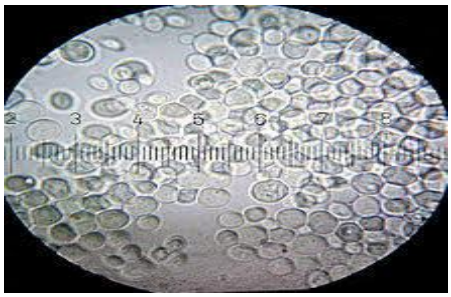
Aroma of the wine was determined by smelling.

7.Taste –

Taste of the wine was determined by mouth feeling

Result and dissusion -

After incubation to check the staining ,biochemical and marphological characterization.and identified as ***Saccharomyces cerevisiae*** was Acid production, Galactose Mannitol test were negative and Urease Glucose ,Raffinose ,Sucrose ,Lactose ,Maltose according to the standard guidelines of Bergey's manual of Determinative Bacteriology volume I



Gram staining of Saccharomyces cerevisiae

Acid production	-
Urease	+
Glucose	+
Raffinose	+
Galactose	-
Sucrose	+
Mannitol	-
Lactose	+
Maltose	+

Biochemical test of isolates

Result of determination of specific gravity –

Specific gravity of palm wine Specific gravity was found in range of 0.98 – 1.04

Wine	Isolate code	Weight of wine	Specific gravity
dragon fruit' wine	SI	50.309	0.98

Determination of sugar content of wine by using refractometer -

Sugar content of wine after fermentation and before fermentation was determined by using refractometer which shows results such as sugar content after fermentation is less than that of before fermentation that means yeast convert sugar into alcohol and carbon-dioxide as a by product.

Wine	Isolate code	Sugar content of fruit juice	Sugar content of juice after fermentation
dragon fruit' wine	SI	17%	9 %

Determination of pH by using pH meter -

Wine	Isolate code	pH of fruit juice	Sugar content of pH juice after fermentation
dragon fruit' wine	SI	4.5	2.9

5.Colour –

Whitish Red Colour of the dragon fruit' wine.

6.Aroma –

Aroma of the dragon fruit' wine was pleasant & Alcoholic.

7.Taste –

dragon fruit' test is sweet and alcoholic.

Conclusions

The study is investigated that showed that dragon fruit' wine is efficient in reducing disease risk have been performed on rats and not humans. In addition, there are hardly any properly controlled study on humans to demonstrate the nutritional benefit of the drink. Furthermore, there is no consistency in the

literature on the concentration of the drink that is beneficial. This may be because the water abundance of the drink varies from location to location and so the actual concentration of palm wine that will facilitate functional benefits is unknown. From currently available data, the evidence that supports palm wine as a multifunctional beverage in humans is weak and needs further research. However, microorganisms and chemical elements and compounds that support nutritional, health and reduction of disease risk in well-known functional foods and beverages are present in dragon fruit' wine.

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