



Isolation of Yeast Isolates from Different Fruits of Yadgiri District, Karnataka

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Yeasts were widely distributed in nature. The population of micro flora on the substrate always depends upon the pH of the substrate. Since, fruits were inhabited by yeasts because of sugar content. Yeast strains associated with fruit surfaces are capable of converting wide range of sugars into alcohol and they can also tolerate high concentration of alcohol. Though yeast of different genera *Kloeckera*, *Hansensiaspora*, *Candida*, *Pichia* are involved but in most cases *Saccharomyces* species dominate the final stage of the fermentation than any other yeast species. The efficiency of yeast strains is determined by their ability to utilize sugar substances, ethanol tolerance capacity, growth at 37°C and alcohol production capacity of yeast strains (1). This present study pertains to isolation and screening of yeast from fruit crops (Sapota, Mango and grape fruits) of Yadgiri district.

An experiment was conducted at the Department of Agricultural Microbiology, College agriculture Bheemarayanagudi University of Agricultural Sciences, Raichur during 2019 to 2020. Fruits samples were collected from the Yadgiri district and were used for further isolation of yeast strains. Yeasts were isolated from Fruits samples by following serial dilution technique using yeast extract malt extract agar (YMA) (1). The yeast forms smooth, white and raised colonies on YMA medium. Isolated yeast strains were purified by four way streaking method. Purified yeast colonies were maintained on YMA slants. For further characterization, yeasts were observed under microscope for colony morphology and size of the cells (1).

Yeast isolates were maintained on Potato Dextrose Agar (PDA) slants and used for further studies. The yeast isolates were studied for colony characters and cell shape.

Gas production: 10 ml of Glucose broth added in test tube and Durham's tube was inserted. By inoculating yeast isolates to glucose broth incubated at 28±2°C for 72 hrs and gas accumulation in Durham's tube is scored as +ve and no gas production is scored as -ve.

Isolation of yeasts from fruit crop samples of Yadgiri district : Fruit samples fruit (Sapota, Mango and Grape)

crops were collected from Yadgiri district. Totally seven yeast isolates were isolated based on colony characters from collected fruit samples of Yadgiri district. (2) isolated 67 yeast isolates from leaves and fruit surfaces of randomly selected papaya plants from the cultivars Solo and Formosa orchard. (3) isolated 24 saprophytic yeasts from pistachio fruits and leaves. (4) isolated 317 yeast isolates from sugar cane and maize rhizosphere, leaves and stalks. (5) isolated the 62 different yeast isolates from the collected fruit samples of cocoa. (1) isolated yeast isolates from fruit samples of Sapota, Grape, Banana, Pomegranate, Apple and Jamun from Dharwad and Bijapur districts.

Yeast population on the fruit crops of Yadgiri district :

Yeast population in the fruit crop of Yadgiri district is presented in the Table 2. Yeast isolates formed smooth white raised colonies on YMA medium. The budding stage of the yeast isolates was observed under (40X and 100X) microscope and confirmed them to be yeast. The highest yeast population was found on the fruit sample of Mango (164) followed by grape (160) and sapota (152). Population of yeast on fruit samples vary because of the variation in the sugar content on fruit samples collected. (6) estimated yeast population on apple and pear fruits and reported that yeast populations on surface of apple fruits was 8×10^3 cfu/g and on surface of pear fruits was 7.3×10^3 cfu/g.

(7) reported the highest *Saccharomyces cerevisiae* count (8.08×10^2 cfu/ml) in grapefruit must and the lowest *S. ellipsoideus* count (7.92×10^2 cfu/ml) in orange must.

Morphology of yeast isolates under microscope :

Yeast colonies were dull white, milky white and white and different growth characteristics like slimy, smeared growth appearance was observed. All the seven yeast isolates were observed under compound microscope cells were oval and round shaped and the size of the cell was measured in micrometer (µm). Colony characters of yeast isolates and their shape and size are presented in the Table-3.

Gas production by yeast isolates : All the seven yeast isolates were tested for Gas production which is an

Table-1 : Fruit sample used for isolation of yeast.

Sl. No.	Sample name	Number of fruits	Fruits weight (gm)
1.	Sapota	2	71
2.	Mango	1	50
3.	Grape	20	150

Table-2 : Yeast population count in plates (Fruit).

Sl. No.	Sample name	Dilution	Population (Numbers)
1.	Sapota	10-1	152
		10-2	130
2.	Mango	10-1	164
		10-2	128
3.	Grape	10-1	160
		10-2	145

Table-3 : Colony morphology of sapota yeast isolates.

Sl. No.	No. of distinct colony	Isolation code	Colony character
1.	02	Sapota-1	Dull white, raised growth, slimy
		Sapota-2	Milky white, slimy growth
2.	02	Mango-1	Dull white, Slimy, raised
		Mango-2	Milky white, slimy
3.	03	Grape-1	Creamy white, slimy
		Grape-2	Dull white, mycelia growth
		Grape-3	Milky white

Table-4 : Gas production by yeast isolates.

Sl. No.	Isolation code	Gas production
1.	Sapota-1	Positive
2.	Sapota-2	Positive
3.	Mango-1	Positive
4.	Mango-2	Positive
5.	Grape-1	Positive
6.	Grape-2	Positive
7.	Grape-3	Positive

indication of fermentation. The results of gas production by yeast isolates are presented in the Table-4. All yeast isolates were positive for gas production. Most of the isolates from fruits were positive for gas production because fruits contain the sugar fermentation. These observations are in accordance with the findings of (8) observed that yeast inoculated to D-xylose broth produced the gas in Durham's tubes. (9) reported that gas production by *Saccharomyces cerevisiae* in glucose broth. (10) reported the glucose fermentation by the yeast isolates like *Candida sergipensis*, *Kluyveromyces marxianus* and *Kloeckera japonica*.

Conclusion

An experiment was conducted at the Department of Agricultural Microbiology, college of agriculture Bheemarayanagudi, University of Agricultural Sciences, Raichur for the isolation and Screening of yeast isolates from different fruit crops like Sapota, Mango and Grape from yadgir district, Karnataka. Toatally seven yeast isolates were isolated from all three fruit samles (Sapota 2, Mango 2 and Grape 3). In this highest yeast population was found in Grape (160), with different colony characters (Dull white, raised growth, slimy) and all Seven yeast isolates shown positive for gas production which indicates that all yeast isolates were fermentative.

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