

## VALUE ADDITION IN A SUN CURED CHEWING TOBACCO (*NICOTIANA TABACUM L*) WITH NATURAL SWEETNERS AND ASTRINGENT TASTENERS

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**Experiments were conducted at ICAR- CTRI Research station farm – bulking shed from 2020-21 to 2021-22 season to evaluate the different natural sweeteners and astringent tasteners viz White sugar, Coconut palm jaggery, Sugarcane jaggery, Palmyrah jaggery at 10% solution and astringent tasteners viz., Coconut mesocarp, Banana peduncle, Banana pseudo stem at 5% solution with a control for value addition in chewing tobacco. The experiment was conducted in a CRBD design with 3 replications. The natural sweeteners and astringent tasteners were treated as per the treatments. The cured leaf of chewing tobacco treated with Palmyra jaggery 10% solution in combination with 5% solution of banana peduncle or banana pseudo stem or coconut mesocarp, increased the weight of treated cured leaves. The weight increased by 13-14 % over the control (untreated). Net return was also higher (Rs 2863 to 2881) with the palmyra jaggery 10 % solution with different astringent tasteners. The chewability scores tested revealed that palmyra jaggery 10 % solution with different astringent tasteners improved the body (8.0), aroma (7.92-8.0), Incrustation (7.9-8.0), taste (7.66-7.92), pungency (7.67-7.83), saliva secretion (6.25-6.42), duration of pungency (6.58-6.83), stiffness in the mouth (7.83-8.0) with a total score of 75 -75.8 out of 80, which was found to be more preferable.**

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### INTRODUCTION

Chewing tobacco is one of the important commercial crops grown in Tamil Nadu and is estimated to be cultivated in an area of about 10000 to 12000 ha with a production of 25000 to 30000 tonnes of cured leaf yield (Kumaresan *et al.*, 2019). Generally, after sun curing and fermentation the cured leaves are marketed. Marketing at this stage reduces the price of cured leaves. If the leaves are stored for long time, the

moisture content in the leaves gets reduced, risk of pests attack, weight loss etc. No production system and production process can be viable without value addition. Value addition is a process that elevates a production into a product. There is a need to go inclusive and critical on value addition process for creating new market demands or indulging renewed demand from the set of conventional customers. The value addition in chewing tobacco prevents the moisture loss, increases the leaf weight, improves the chewing quality and reduces the pest attack. Even though considerable work on value addition was done in many crops, particularly vegetable crops (Pankaj *et al.*, 2019), no work was done on value addition in chewing tobacco and hence the present study was taken up.

### MATERIALS AND METHODS

Experiments were conducted at ICAR- CTRI Research station farm – bulking shed from 2020-21 to 2021-22 season to evaluate the different natural sweeteners and astringent tasteners viz White sugar, Coconut palm jaggery, Sugarcane jaggery, Palmyrah jaggery at 10% solution and astringent tasteners viz., Coconut mesocarp, Banana peduncle, Banana pseudo stem at 5% solution with a control in a CRBD design with 3 replications. The treatments comprised of White sugar 10% solution + Coconut mesocarp 5% solution, White sugar 10% solution + Banana peduncle 5% solution, White sugar 10% solution + Banana pseudo stem 5% solution, Coconut palm jaggery 10% solution + Coconut mesocarp 5% solution, Coconut palm jaggery 10% solution + Banana peduncle 5% solution, Coconut palm jaggery 10% solution + Banana pseudo stem 5%

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**Key Words:** Value addition, Chewing Tobacco, Natural sweeteners, Astringent tasteners

solution, Sugar cane jaggery 10% solution + Coconut mesocarp 5% solution, Sugar cane jaggery 10% solution + Banana peduncle 5% solution, Sugar cane jaggery 10% solution + Banana pseudo stem 5% solution, Palmyra jaggery 10% solution + Coconut mesocarp 5% solution, Palmyra jaggery 10% solution + Banana peduncle 5% solution, Palmyra jaggery 10% solution + Banana pseudo stem 5% solution and Control (Without sweetener or astringent tastners). The sun cured Tobacco leaves were collected during the season 2020-21 and 2021-22 . The natural sweeteners and astringent tasteners were treated as per the treatments. The astringent tasteners viz., coconut mesocarp, banana peduncle, banana pseudo stem were collected and chopped separately. Five kilograms of astringent tastener was soaked in 10 litres of water for 4 days. After 4 days the palmyrah jaggery 10 kg was soaked in the solution of astringent tasteners for one hour. Chewing tobacco cured leaves (10 bundles, 33 kg) were collected in the go down was dipped in the solution and the excess solution was drained and the leaves are bulked for 3- 4 weeks. The economics was worked out as per the prevailing market rate. The chewing quality was tested with three quality testers. The chewing quality viz., body (10), Aroma (10), Incrustation (10), Taste(10), Pungency(10), Saliva secretion (10), Duration of pungency (10), Stiffness in the mouth (10) with a total score of 80, the procedure suggested by Palanichamy and Nagarajan ( 1989 ) was followed in this experiment.

## RESULTS AND DISCUSSION

The cured leaf of chewing Tobacco treated with Palmyra jaggery 10% solution in combination with 5% solution of banana peduncle or banana pseudo stem or coconut mesocarp, increased the weight of treated cured leaves. The weight increased by 13-14 % over the control (untreated). The price of treated leaves was Rs. 90/ kg with the Palmyra jaggery 10% solution treated with different astringent tasteners(Table 1). The increase in the weight could be attributed to the stickiness of the Palmyra jaggery solution which in turn formed a coating in the leaves, reduced the moisture loss in leaves, thereby increased weight of the treated leaves.

The expenditure was higher with coconut palm jaggery 10% solution with different astringent tasteners (Rs 416.77 for 33 kg leaves) followed by Palmyra jaggery 10% solution treatment with different astringent tasteners ( Rs 403.14 for 33 kg leaves). The lesser availability resulted in higher cost of the coconut as well as palmyra jaggery thereby higher expenditure. The lowest expenditure of Rs 123.3 for 33 kg leaves was recorded with white sugar 10 % solution with different astringent tasteners. The cheaper cost of white sugar resulted in lower expenditure.

The gross return was significantly higher (Rs 3276 to 3330) with the palmyra jaggery 10 % solution with different astringent tasteners treated leaves as compared to control. The higher weight and increased quality increased the price of the leaves thereby higher gross returns. The gross returns increased by 28 % with the palmyra jaggery 10 % solution with different astringent tasteners as compared to the control. Net return was also significantly higher (Rs 2863 to 2881) with the palmyra jaggery 10 % solution with different astringent tasteners as compared to the control. The higher gross return increased the net return also. The increase in the net return was 12 to 13 % as compared to the control.

The chewability scores tested revealed that palmyra jaggery 10 % solution with different astringent tasteners improved the body (8.0), aroma (7.92 -8.0), Incrustation (7.9-8.0), taste( 7.66-7.92), pungency( 7.67-7.83), saliva secretion (6.25-6.42), duration of pungency (6.58-6.83), stiffness in the mouth (7.83-8.0) with a total score of 75 -75.8 out of 80, which was found to be more preferable (Table 2). The phenols in the astringent tasteners and the sweetness in the palmyra jaggery improved the chewability scores.

It can be concluded that value addition in chewing tobacco can be done with palmyrah jaggery solution at 10% with 5% solution of coconut mesocarp or banana pseudo stem or banana peduncle for increased net return and improved the chewability scores viz., body, aroma, whitish encrustation, taste, pungency, saliva secretion, duration of pungency, stiffness in the mouth.

**Table 1: Economics of different treatments**

| <b>Treatments</b>   | <b>Cured leaf before treatment (kg)</b> | <b>Cured leaf after treatment (kg)</b> | <b>Price/ kg of leaf</b> | <b>Expenditure (Rs)</b> | <b>Gross return (Rs)</b> | <b>Net return (Rs)</b> |
|---|---|--|--------------------------|-------------------------|--------------------------|------------------------|
| White sugar 10% solution + coconut mesocarp 5% solution           | 33                                      | 34.2                                   | 82                       | 126.39                  | 2804                     | 2678                   |
| White sugar 10% solution + banana peduncle 5 % solution           | 33                                      | 34.8                                   | 82                       | 126.39                  | 2854                     | 2727                   |
| White sugar 10% solution + banana pseudo stem 5% solution         | 33                                      | 34.25                                  | 82.5                     | 126.39                  | 2826                     | 2699                   |
| Coconut palm jaggery 10% solution + coconut mesocarp 5 % solution | 33                                      | 34.3                                   | 84                       | 416.77                  | 2881                     | 2464                   |
| Coconut palm jaggery 10% solution + banana peduncle 5% solution   | 33                                      | 34.45                                  | 84                       | 416.77                  | 2894                     | 2477                   |
| Coconut palm jaggery 10% solution + banana pseudostem 5% solution | 33                                      | 34                                     | 84                       | 416.77                  | 2856                     | 2439                   |
| Sugar cane jaggery 10% solution + coconut mesocarp 5 % solution   | 33                                      | 34.3                                   | 82                       | 155                     | 2813                     | 2657                   |
| Sugar cane jaggery 10% solution + banana peduncle 5 % solution    | 33                                      | 34.35                                  | 82                       | 155                     | 2817                     | 2661                   |
| Sugar cane jaggery 10% solution + banana pseudostem 5% solution   | 33                                      | 35.25                                  | 82                       | 155                     | 2891                     | 2735                   |
| Palmyrah jaggery 10% solution + coconut mesocarp 5% solution      | 33                                      | 36.5                                   | 90                       | 403.14                  | 3285                     | 2881                   |
| Palmyrah jaggery 10% solution + banana peduncle 5 % solution      | 33                                      | 36.45                                  | 90                       | 403.14                  | 3281                     | 2877                   |
| Palmyrah jaggery 10% solution + banana pseudostem 5% solution     | 33                                      | 36.3                                   | 90                       | 403.14                  | 3267                     | 2863                   |
| Control   | 33                                      | 32                                     | 80                       | 0                       | 2560                     | 2560                   |
| SEm+/-  |   |  |                          |                         | 170.2                    | 90.3                   |
| CD@5%   |   |  |                          |                         | 525.6                    | 280.5                  |

**Table 2: Effect of different treatments in Chewability Test**

| Quality Characteristics   | Body (10) | Aroma (10) | Incrustation (10) | Taste (10) | Pungency (10) | Saliva secretion (10) | Duration of pungency (10) | Stiffness in the mouth (10) | Total score out of 80 |
|---|-----------|------------|-------------------|------------|---------------|-----------------------|---------------------------|-----------------------------|-----------------------|
| White sugar 10% solution + coconut mesocarp 5% solution           | 7.66      | 7.23       | 7.75              | 7.08       | 7.0           | 5.83                  | 5.5                       | 7.08                        | 68.9                  |
| White sugar 10% solution + banana peduncle 5 % solution           | 7.66      | 7.08       | 7.58              | 6.92       | 7.08          | 5.58                  | 5.5                       | 7.17                        | 68.2                  |
| White sugar 10% solution + banana pseudo stem 5% solution         | 7.75      | 7.16       | 7.33              | 6.92       | 6.92          | 5.33                  | 5.5                       | 7.0                         | 67.3                  |
| Coconut palm jaggery 10% solution + coconut mesocarp 5 % solution | 8.0       | 7.23       | 7.17              | 7.08       | 7.46          | 5.33                  | 5.75                      | 7.0                         | 68.7                  |
| Coconut palm jaggery 10% solution + banana peduncle 5% solution   | 8.0       | 7.50       | 7.75              | 7.17       | 7.08          | 5.58                  | 5.66                      | 7.17                        | 69.8                  |
| Coconut palm jaggery 10% solution + banana pseudostem 5% solution | 8.0       | 7.50       | 7.42              | 6.91       | 7.17          | 5.66                  | 5.58                      | 7.33                        | 69.4                  |
| Sugar cane jaggery 10% solution + coconut mesocarp 5 % solution   | 8.0       | 7.33       | 7.5               | 6.33       | 6.58          | 5.67                  | 5.5                       | 7.25                        | 67.7                  |
| Sugar cane jaggery 10% solution + banana peduncle 5 % solution    | 8.0       | 7.67       | 6.91              | 6.66       | 6.92          | 5.67                  | 5.83                      | 7.17                        | 68.5                  |
| Sugar cane jaggery 10% solution + banana pseudostem 5% solution   | 7.92      | 7.5        | 7.42              | 6.83       | 7.0           | 5.75                  | 6.0                       | 7.17                        | 69.4                  |
| Palmyrah jaggery 10% solution + coconut mesocarp 5% solution      | 8.0       | 8.0        | 8.0               | 7.83       | 7.83          | 6.42                  | 6.58                      | 8.0                         | 75.8                  |
| Palmyrah jaggery 10% solution + banana peduncle 5 % solution      | 8.0       | 7.92       | 7.9               | 7.66       | 7.67          | 6.25                  | 6.83                      | 7.83                        | 75.0                  |
| Palmyrah jaggery 10% solution + banana pseudostem 5% solution     | 8.0       | 8.0        | 8                 | 7.92       | 7.66          | 6.42                  | 6.83                      | 7.83                        | 75.8                  |
| Control   | 7.0       | 6.33       | 4.0               | 5.33       | 5.66          | 5.33                  | 4.92                      | 6.0                         | 55.7                  |

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