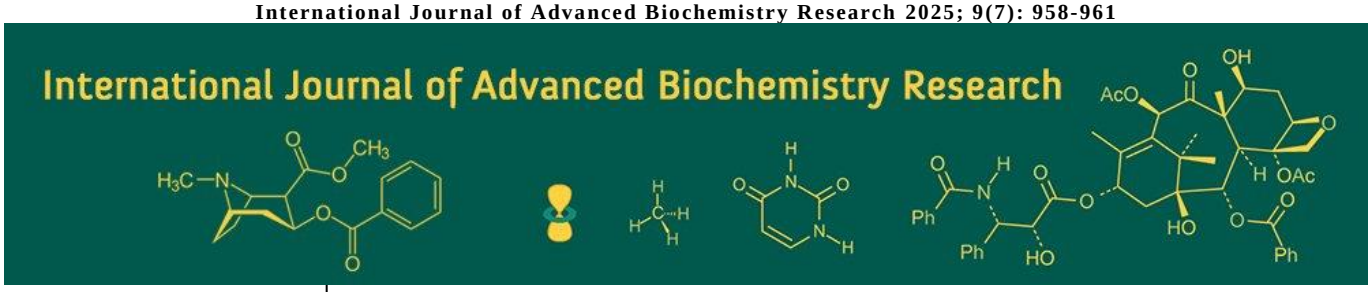

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Influence of exogenous NAA application on quality attributes of dragon fruit

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Abstract
The present investigation entitled “Influence of exogenous NAA on quality attributes of dragon fruit” was carried out at Instructional Farm, Polytechnic in Horticulture, Junagadh Agricultural University, Junagadh during the year 2024. The experiment was laid out in a Randomized Block Design (RBD) with a Factorial concept, involving four levels of GA3 and two levels of NAA, each replicated three times. With the application of NAA, the result was obtained significant in case of quality parameters like total sugar, reducing sugar, non-reducing sugar and titrable acidity. However, maximum total sugar (12.46%), reducing sugar (9.37%), non-reducing sugar (3.09%) and minimum acidity (0.30%) were observed in 20 ppm NAA application (N1). From the present study, it can be inferred that the spraying of 20 ppm NAA at 7, 14 and 21 days after the flowering led to the superior results for the quality of dragon fruit.

Keywords: Dragon fruit, NAA, quality

Introduction
Dragon fruit is a potential and lucrative fruit crop and a super fruit that was just recently introduced in India. Growers from all over India are drawn to plant this fruit crop, which originated in Central and South America and Mexico because of its extremely appealing color, mouth melting pulp, edible seed embedded in the pulp and exceptional nutritional value.

It is easy to cultivate and requires minimal care as compared to other fruit crops. It is a long-day plant and blooms only at night. The large white fragrant flowers of the typical cactus flower shape are among those called “moonflower” or "Queen of the Night" because of its stunning night-blooming blossom.

Dragon fruit is a member of the plant family Cactaceae and the genus *Hylocereus*. This genus is primarily distinguished by climbing vine cactus with aerial roots that bear a glabrous beautiful berry with big scales. The huge, creamy white blossoms, which measure 25 cm in diameter and bloom at night, are so lovely that they have decorative value. With this, future fruit crops are anticipated. *Hylocereus* spp. have diploid chromosome number (2n = 22).

Both fresh and processed forms of dragon fruit are edible. Dragon fruit is the best fruit for salads because of its vibrant bracts, tasteful little black seeds imbedded in it and pulp that is a dark red and white color. It can be used to make a variety of value-added goods, such as juice, jam, jelly, candies, syrup, ice cream, pastries, wine, etc. Peel of dragon fruit has found to be rich source of pectin and can be used as a colouring agent and raw material for food industries. Because betalain pigment is present in red pitaya, using it as a raw material increases both the final product's nutritional value and look greatly.

Dragon fruit is a Wondrous Fruit of 21st century and is set to ring in a revolution in the Indian Horticulture Scenario. It is a boon to the farmers and consumers as it gains popularity as a fast return perennial crop. Dragon fruit comes into flowering in various flushes so it is necessary to maintain the quality of produced fruits. The production of poor-quality fruits is a matter of common experience. It would be therefore worthwhile to improve the quality of fruit crops by foliar application of plant growth regulators.

Materials and Methods
An investigation on “Influence of exogenous NAA on quality attributes of dragon fruit” was

conducted at Instructional Farm, Polytechnic in Horticulture, Junagadh Agricultural University, Junagadh during the year 2024-25. The design of experiment was Randomized Block Design with Factorial concept (FRBD), which involving four levels of GA3: 0 ppm GA3 (G0), 20 ppm GA3 (G1), 30 ppm GA3 (G2), 40 ppm GA3 (G3) and two levels of NAA: 0 ppm NAA (N0), 20 ppm NAA (N1), each replicated three times.

Preparation of NAA solution

For preparing 20 mg/l concentration of naphthalene acetic acid (NAA), the required quantity i.e. 6 mg of NAA was weighted and dissolved in NaOH just sufficient to dissolve the powder and then volume was made up with distilled water and finally made 300 ml of solution for spraying of each pillar as per treatment.

The standard method of analysis of variance was used for analysing the data for the FRBD design. (Panse and Sukhatme, 1985) [16].

Results and Discussion

The data analysed to the total sugar, reducing sugar, non-reducing sugar as influenced by the different levels of GA3, NAA and their interaction effect are tabulated in Table 1 and graphically illustrated in Fig. 1 and for acidity content of dragon fruit analysed data are tabulated in Table 2 and graphically illustrated in Fig. 2.

Total sugar (%)

The data presented in Table 1 showed that the variation of different treatments of NAA on total sugar was observed significant and significantly maximum total sugar (12.46%) was observed in 20 ppm NAA (N1).

NAA had shown significant increase in the total sugar and this might be due to synthesis of auxin in plants, which increase the physiological activities and in turn helps in increasing sugar contents.

The results are also in accordance with the findings of Sharma *et al.* (1990) [17] and Shinde *et al.* (2006) [18] in mango.

Reducing sugar (%)

The data presented in Table 1 showed that the variation of different treatments of NAA on total sugar was observed significant and significantly maximum reducing sugar (9.37%) was observed in 20 ppm NAA (N1).

The significant improvement in sugars might be due to better formation and translocation of carbohydrates which improved the fruit quality.

These results are in line with Tsomu *et al.* (2019) [20] in mango, Garasiya *et al.* (2013) [13] in guava and Bhati and Yadav (2004) [5, 6] in ber.

Non-reducing sugar (%)

The data presented in Table 1 showed that the variation of different treatments of NAA on total sugar was observed significant and significantly maximum non-reducing sugar (3.09%) was observed in 20 ppm NAA (N1).

The higher enzymatic activity like a-amylase and invertage with the application of NAA might be responsible for the higher non-reducing sugar content in fruits.

These results are in line with Singh *et al.* (1989) [19] in ber.

Titrable acidity (%)

The assessment of data in Table 2 showed that the variation of different treatments of NAA on titrable acidity was observed significant and minimum acidity (0.30%) observed when NAA applied at 20 ppm (N1).

This decrease in acidity content of fruits might be due to increase in total sugar content of fruit. The acids under the influence of chemicals might have either been converted into sugars and their derivatives by the reactions involving reversal of glycolytic pathway or may be have been used as a substrate in the respiration or both.

These results are also observed by Bal *et al.* (1984) [3] and Bhati and Yadav (2004) [5, 6] in ber, Kher *et al.* (2005) [15] in guava.

Table 1: Effect of NAA on total sugar, reducing sugar and non-reducing sugar of dragon fruit

Sr. No.	Treatments	Total sugar (%)	Reducing sugar (%)	Non-reducing sugar (%)
Factor A-GA3				
G0	0 ppm	11.86	8.98	2.88
G1	20 ppm	12.11	9.14	3.01
G2	30 ppm	11.76	8.87	3.03
G3	40 ppm	11.47	8.88	2.59
S.Em.±		0.495	0.368	0.124
C.D. at 5%		NS	NS	NS
Factor B-NAA				
N0	0 ppm	11.15	8.57	2.66
N1	20 ppm	12.46	9.37	3.09
S.Em.±		0.350	0.260	0.088
C.D. at 5%		1.06	0.79	0.27
Interaction: G X N				
S.Em.±		0.700	0.520	0.176
C.D. at 5%		NS	NS	NS
C.V.%		10.27	10.05	10.58

Table 2: Effect of NAA on titrable acidity content of dragon fruit

Sr. No.	Treatments	Titrable acidity (%)
Factor A-GA3		
G0	0 ppm	0.34
G1	20 ppm	0.32
G2	30 ppm	0.31
G3	40 ppm	0.33
S.Em.±		0.011
C.D. at 5%		NS
Factor B-NAA		
N0	0 ppm	0.35
N1	20 ppm	0.30
S.Em.±		0.35
C.D. at 5%		0.30
Interaction: G X N		
S.Em.±		0.016
C.D. at 5%		NS
C.V.%		8.62

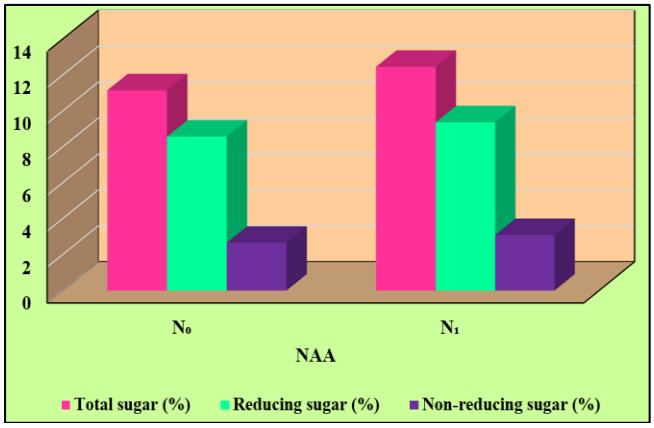

Fig 1: Effect of NAA on total sugar, reducing sugar and non-reducing sugar of dragon fruit

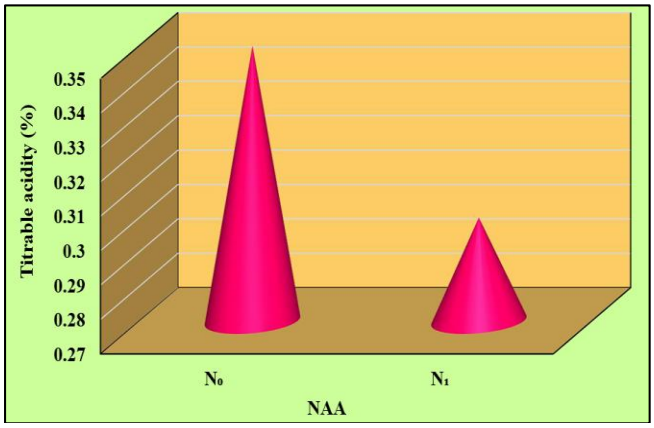

Fig 2: Effect of NAA on titrable acidity of dragon fruit

Conclusion

Based on the present investigation, it can be concluded that the application of NAA at 20 ppm significantly enhance total sugar, reducing sugar and non-reducing sugar of dragon fruit as well as minimum acidity also observed with same treatment. Exogenous application of NAA at 7, 14 and 21 days after flowering leads to superior results in relation to quality attributes of dragon fruit.

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