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Estimates of chemical characteristics of bael (*Aegle marmelos* Correa) genotypes under SODIC soil

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Abstract
The present investigation entitled **"**Estimates of chemical characterstics of bael (*Aegle marmelos* Correa) genotypes under sodic soil." was carried out at the Main Experiment Station, Department of Horticulture, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during the years 2016-2017. The experiment was conducted in Randomized Block Design with twelve genotypes and replicated three times, considering one plant as a unit. On the basis of chemical attributes of bael fruit *viz*. Minimum acidity(0.29%) found in ND/AH-25, total soluble solids (39.00) in ND/AH-10, are found is best in ND/AH-8. Maximum total sugars (16.02%) are recorded best in ND/AH-27. Highest non-reducing sugar (10.02%) is recorded best in ND/AH-21. Minimum ascorbic acid (30.96mg/100g) is recorded best in ND/AH-26. The highest reducing sugar (7.07%) is recorded best in ND/AH-9.

Keywords: triclosan, TCS, determination, detection, sensor

Introduction
Bael fruit (*Aegle marmelos* Correa) is a tropical fruit native to south-east Asia and belongs to family Rutaceae. It is an important indigenous fruit of India. It is also known as 'Bengal Quince'. Aegle, the genous of bael is monotypic. It is a midsized, slender, aromatic, armed, gum-bearing tree growing up to 18 meter tall. It has a compound leaf with three leaflets. It has been known in India from prehistoric times and is more prized for its medicinal virtues than its edible quality. In Hinduism the tree is considered sacred. It is used for worship of lord Shiva, Who is said to favour the leaves. The trifoliate leaves symbolize the trident the Shiva holds in his right hand. The fruit were used in place of Coconuts before large-scale rail transportation become available. The fruit is said to resemble a skull with a white, bone-like outer shell and a soft inner part. The tree grows wild in dry forests on hills and plains of central and southern India, Burma, Pakistan, Bangladesh, Sri Lanka, Northern Malaya, Java, and Philippine Islands. However there was no organized orcharding of bael in India but now a day organized orchard are having planted it grows mainly wild and in temple gardens in early years. The fruit is available in almost all states of India, but most abundantly available in Uttar Pradesh, Bihar, West Bengal and Odisha, In Odisha the fruit is predominantly present in forests of Dhenkanal, Angul, Bolangir and Rayagada districts. It has a reputation in India for being able to grow in places where other trees cannot grow. The fruit is very hardy and can grow even under adverse agro-climatic conditions. Most of the tropical and subtropical condition fruits have a poor keeping quality but this let fruit can be kept for a longer period because of its hard outer shell and as, it can easily withstand transport and marketing hazards. It copes with a wide range of soil pH of 5-10 and a wide temperature tolerance from 7degree to 48 degree C. It requires a pronounced dry season to give fruit.
The chemical constituents, quality, taste and palatability of the bael fruit differ from genotype to genotype at different stage. Considering the importance of bael fruits in there is need to evaluate the quality attributes of bael genotypes, keeping in view the present investigater has been work out to "Studies on Physico-chemical attributes of bael genotype fruits in sodic soil condition" with the objective:
To find out the chemical characterstics of bael genotypes

Material & Methods
The present investigation entitled "Studies on Physico-chemical attributes of bael fruit (*Aegle*

(*Aegle marmelos* Corria) in sodic soil condition." was carried out at Main Experimental Station and P.G. Laboratory of the Horticulture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during the year 2016-17. The experiment was conducted in Randomized Block Design with twelve genotypes and replicated three times, considering one plant as a unit.

Results and Discussion

Chemical attributes of fruits

Total soluble solids (^{0}Brix)

Data displayed in Table no.-1 showed that the total soluble solid of bael fruit was found non-significant. Maximum (39.00^{0}Brix) total soluble solid was noted in genotype ND/AH-10 followed by genotype ND/AH-8 (38.67^{0}Brix).The minimumtotal soluble solid (35.00^{0}Brix) was noted with genotype ND/AH-26.

Table 1: Estimates of total soluble solids of fruits in bael genotype.

Bael genotypes	Total soluble solids (^{0}Brix)
ND/AH-8	38.67
ND/AH-9	38.00
ND/AH-10	39.00
ND/AH-11	37.33
ND/AH-12	36.00
ND/AH-16	37.67
ND/AH-17	36.33
ND/AH-21	36.00
ND/AH-25	38.33
ND/AH-26	35.00
ND/AH-27	37.33
NB-21	36.67
S. Em ±	0.85
CD at 5%	2.50

Ascorbic acid (mg100g^{-1})

It is obvious from the data presented in Table-2 that the ascorbic acid of bael fruit was found significant. The maximum (48.16mg/ 100gpulp) ascorbic acidwas recordedwith genotype ND/AH-17 whereas minimum (30.96 mg/ 100gpulp) ascorbic acid contentwas recorded in genotype ND/AH-26.

Table 2: Estimates of Ascorbic acid of fruits in bael genotype.

Baelgenotypes	Ascorbic acid (mg/100gpulp)
ND/AH-8	37.27
ND/AH-9	40.71
ND/AH-10	47.01
ND/AH-11	37.84
ND/AH-12	44.15
ND/AH-16	47.01
ND/AH-17	48.16
ND/AH-21	38.41
ND/AH-25	36.48
ND/AH-26	30.96
ND/AH-27	38.76
NB-21	37.73
S. Em ±	1.48
CD at 5%	4.35

Acidity (percent)

It is evident from the data arranged in Table-3 that the acidity of bael fruit was found significant. The maximum (0.46%) acidity was recorded as the genotype ND/AH-10 & ND/AH-17. The minimum (0.29%) acidity was recorded in genotype ND/AH-25.

Table 3: Estimates of Acidity of fruits in bael genotype.

Bael genotypes	Acidity (%)
ND/AH-8	0.43
ND/AH-9	0.38
ND/AH-10	0.46
ND/AH-11	0.41
ND/AH-12	0.44
ND/AH-16	0.42
ND/AH-17	0.46
ND/AH-21	0.36
ND/AH-25	0.29
ND/AH-26	0.34
ND/AH-27	0.39
NB-21	0.44
S.Em ±	0.01
CD at 5%	0.04

Reducing sugars (percent)

It is evident from the data arranged in Table-4 that the reducing sugars of bael fruit was found significant. The maximum (7.07%) reducing sugars of bael fruit was estimated in genotype ND/AH-9 followed by (6.67%) in ND/AH-16 where as minimum (5.48%) reducing sugars was noted genotype ND/AH-21.

Table 4: Estimates of reducing sugar of fruits in bael genotype.

Bael genotype	Reducing sugar (%)
ND/AH-8	5.89
ND/AH-9	7.07
ND/AH-10	5.93
ND/AH-11	6.27
ND/AH-12	6.20
ND/AH-16	6.67
ND/AH-17	6.13
ND/AH-21	5.48
ND/AH-25	5.80
ND/AH-26	5.87
ND/AH-27	6.41
NB-21	5.49
S.Em ±	**0.26**
CD at 5%	**0.77**

Non-reducing sugar (percent)

Data presented in Table-5 showed that the non-reducing sugar was noted significant. Non-reducing sugar was noted maximum (10.02%) in genotype NB-21followed by (9.84%) in baelgenotype ND/AH-21where as minimum (7.52%) non-reducing sugar was noted in bael genotype ND/AH-26.

Table 5: Estimates of non-reducing sugar of fruits in bael genotype.

Baelgenotypes	Non-reducing sugar (%)
ND/AH-8	9.24
ND/AH-9	8.11
ND/AH-10	9.31
ND/AH-11	9.09
ND/AH-12	8.90
ND/AH-16	9.29
ND/AH-17	8.77
ND/AH-21	9.84
ND/AH-25	9.21
ND/AH-26	7.52
ND/AH-27	9.60
NB-21	10.02
S.Em ±	0.21
CD at 5%	0.60

Total sugars (percent)

Data displayed in Table-6 showed that the total sugars of bael fruit was found significant. The maximum (16.02%) total sugar was recorded inbael genotype ND/AH-27 followed by (15.96%) in bael genotype ND/AH-16. The minimum (13.39%) total sugar was recorded in bael genotype ND/AH-26.

Table 6: Estimates of total sugars of fruits in bael genotype.

Bael genotypes	Total sugars (%)
ND/AH-8	15.14
ND/AH-9	15.18
ND/AH-10	15.24
ND/AH-11	15.35
ND/AH-12	15.10
ND/AH-16	15.96
ND/AH-17	15.24
ND/AH-21	15.32
ND/AH-25	15.01
ND/AH-26	13.39
ND/AH-27	16.02
NB-21	15.52
S.Em ±	0.28
CD at 5%	0.83

Summary & Conclusion

The total soluble solids were noted maximum with the genotype ND/AH-10 followed by ND/AH-8.The minimum acidity percentage was noted in genotype ND/AH-25 and maximum with the genotype ND/AH-10&ND/AH-17. The maximum ascorbic acid content was recorded with the bael genotype ND/AH-17 and minimum with genotype ND/AH-26.The highest reducing sugar content was obtained with the bael genotype ND/AH-9 followed by ND/AH-16 and minimum with genotype ND/AH-21. The highest non-reducing sugar content was obtained with the genotype NB-21 followed by ND/AH-21 and minimum with genotype ND/AH-26. The maximum total sugars content was obtained with the bael genotype ND/AH-27 followed by ND/AH-16 and minimum with genotype ND/AH-26. Based on present investigation it can be concluded that the evaluation of physic-chemical attributes of bael fruit *viz.*, total soluble solids, ascorbic acid (Vitamin C), reducing sugar, non-reducing sugar and total sugars, genotypes ND/AH-8, ND/AH-11, ND/AH-17, ND/AH-25 and NB-21 can be recommended for commercial cultivation in Eastern Uttar Pradesh.

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