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EVALUATION OF VEGETABLE MESTA (*HIBISCUS SABDARIFFA*) FOR GROWTH AND YIELD CHARACTERS

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Abstract

Investigation was carried out with 26 diverse genotypes of Mesta to evaluate their performance based on leaf yield and biochemical attributes. The mean performance estimates and analysis of variance indicated that there was a considerable variation for all the characters studied. Among the 26 genotypes studied the genotype RIN 287 recorded highest leaf yield per plant and also highest calcium content. Considering the leaf yield and other component characters, the genotype RIN 287, RIN 356 and RIN 352 showed superior performance and they have also recorded highest quality parameters. The high yielding genotypes RIN 287, RIN 356, RIN 281 and RIN 352 could be used in large scale for green production.

Key words: Mesta, Evaluation, growth, quality, yield

Introduction

Vegetable Mesta is one of the underexploited leafy vegetable grown throughout the tropics and it belongs to the family malvaceae. Tender leaves of Mesta are used for preparing curry (or) chutney in several parts of south India. Calyces of flowers are used in preparing processed products like Jam, Jelly and slightly acidic syrups with an attractive colour. Leaves are acidic in nature, so the products prepared by this can be stored without spoilage for 3-4 days. The leaves are good source of calcium and iron. It is a regular leafy vegetable of the poor farmers. The nutritive value of mesta viewed in terms of calcium, protein, vitamin C, besides iron in comparison with other leafy vegetables. The alleviating effect of green leafy vegetables not only rest on the iron content, but also on the high ascorbic acid content which considerably improves the absorption of iron. Selection is an intrinsic part of all vegetative crop improvement. In selecting a plant type one should be reasonably sure of the superiority of the selection. Selection helps in improving the yield; however selection based on yield alone is often misleading because it is one of the most complex characters being dependent on its components for its full expression. Considering the nutritive importance of this crop (Narayan reddy *et al*., 1990) there is a prime need for evaluation of available germplasm in this regard is most essential.

Table 1: Morphological characters and source of 26 vegetable Mesta genotypes

Genotype	Salient features
RIN-40	Tall, Leaves – penta lobed, stem-green with purple pigmentation
RIN-92	Medium, Leaves – penta lobed, stem-green with purple pigmentation
RIN-93	Medium, Leaves – pentalobed, stem-green with purple pigmentation
RIN-97	Tall, Leaves – pentalobed, stem-green with purple pigmentation
RIN-99	Tall, Leaves – pentalobed, stem-green with purple pigmentation
RIN-100	Tall, leaves – cotton leaf type, stem –green
RIN-102	Tall, leaves – cotton leaf type, stem –green with purple pigmentation
RIN-105	Tall, leaves – cordate, stem – purple
RIN-107	Medium , leaves – pentalobed, stem – green
RIN-166	Medium , leaves – pentalobed, stem – green
RIN-276	Medium, upper leaves palmate, lower leaves cordate, stem purple
RIN-280	Short, upper leaves palmate, lower leaves cordate, stem purple
RIN-281	Medium, upper leaves palmate, lower leaves cordate, stem purple
RIN-282	Tall, Leaves – pentalobed, stem-green

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Genotype	Salient features
RIN-287	Tall, upper leaves palmate, lower leaves cordate, stem purple
RIN-305	Short, Leaves – pentalobed, stem-purple
RIN-340	Medium, leaves–pentalobed, stem–green with purple pigmentation
RIN-351	Tall, Leaves – penta lobed, stem-green with purple pigmentation
RIN-352	Tall, Leaves – penta lobed, stem-green with purple pigmentation
RIN-355	Tall, Leaves – penta lobed, stem-green with purple pigmentation
RIN-356	Medium, upper leaves palmate, lower leaves cordate, stem purple
RIN-359	Medium, upper leaves palmate, lower leaves cordate, stem green
RIN-361	Short, leaves – cordate, stem green
RIN-362	Medium, leaves – cordate, stem green
RIN-403	Medium, leaves, cotton leaf stem – green with purple pigmentation
RIN-405	Short, leaves – cordate, stem-green

Hence the experiment was carried out to evaluate the Mesta genotype for growth and leaf yield characters and to select the best genotype for higher yield and nutritional quality.

Materials and methods

The investigation was carried out at the orchard, Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalainagar during 2008-2009. The seed material of the 26 different Mesta genotypes were obtained from Agricultural Research Station, Amandalavalasa, Andhrapradesh and Central Research Institute for Jute and Allied Fibres, West Bengal was included in the study. Salient features of the genotypes are presented in table 1. The twenty six genotypes of mesta were evaluated under field conditions during summer and *kharif* season of 2008 in a Randomized Block Design with three replications. A plot size of 1.2 × 4.5 m was adopted with a spacing of 30 × 10 cm. The experimental plot was ploughed and brought to a fine tilth. The earlier dose of 40:20:20 kg N: P_2O_5: K_2O ha^{-1} was applied at the time of sowing. Seeds of each genotype were sown by hand dibbing. Five plants from each genotype were selected randomly and the averages from these plants were worked out. Observations such as plant height, leaf length, leaf width, leaf area, number of leaves, fresh weight of leaves, fresh weight of stem,, leaf to stem ratio, dry weight of leaf, dry weight of stem, total dry weight of the plant and biochemical parameters such as ascorbic acid content, total soluble solids, leaf fibre content, reducing and non reducing sugars, nitrogen, protein, calcium and iron were estimated and presented in the tables.

Results and discussion

The *Per se* performance of Vegetable Mesta for qualitative characters and biochemical parameters during *kharif* and summer season are given in table 2 and table 3. The analysis of variance indicated highly significant variation found among genotypes for characters *viz.*, plant height, leaf length, leaf width, leaf area, number of leaves per plant, stem girth, fresh weight of leaf, fresh weight of stem, total green yield, leaf to stem ratio, dry weight of leaf, dry weight of stem and total dry weight during both

Table 2: *Per se* performance of 26 genotypes of vegetable Mesta for important quantitative characters

S. No.	Genotypes	Plant height (cm)	No. of leaves /plant	Leaf area (cm^2)	Fresh weight of leaves (g)	Fresh weight of stem(g)	Total green yield (g)	Total dry weight (g)
1.	RIN-40	31.02	12.54	23.69	10.78	11.99	23.43	2.63
2.	RIN-92	31.79	13.64	131.65	10.88	11.99	24.63	2.67
3.	RIN-93	28.82	10.56	102.79	10.45	9.79	18.37	2.14
4.	RIN-97	39.82	28.05	196.12	25.96	21.67	45.93	5.21
5.	RIN-99	32.45	13.86	143.64	12.87	13.84	32.45	3.10
6.	RIN-100	22.55	10.23	87.83	8.10	5.11	14.46	1.60
7.	RIN-102	31.79	13.64	139.15	12.76	12.87	26.83	2.85
8.	RIN-105	38.05	24.19	177.73	23.76	21.45	44.50	4.89
9.	RIN-107	30.80	12.32	120.98	10.55	10.99	22.44	2.43
10.	RIN-166	28.82	11.02	104.08	10.45	10.21	20.67	2.18
11.	RIN-276	39.05	26.40	185.88	24.81	21.64	45.90	5.08
12.	RIN-280	33.22	16.27	145.43	15.95	14.08	34.16	3.33
13.	RIN-281	41.36	30.25	197.55	26.12	21.72	47.68	5.41
14.	RIN-282	29.37	12.20	116.18	10.45	10.51	22.44	2.41
15.	RIN-287	35.62	36.30	205.25	35.81	36.55	58.18	7.16
16.	RIN-305	35.75	18.04	164.99	21.61	18.58	37.57	4.42
17.	RIN-340	21.45	9.35	86.80	4.06	4.67	8.73	0.96
18.	RIN-351	37.62	23.98	175.98	23.76	21.21	43.23	4.74
19.	RIN-352	23.65	10.34	99.16	9.35	6.58	17.48	1.76
20.	RIN-355	42.68	32.79	199.81	26.18	25.10	55.64	5.65
21.	RIN-356	43.45	35.86	200.91	31.79	28.50	56.99	6.39
22.	RIN-359	33.55	17.16	152.95	18.58	14.96	34.61	3.77
23.	RIN-361	35.86	21.34	167.92	23.65	19.75	40.26	4.69
24.	RIN-362	34.42	17.16	163.08	20.57	18.32	36.57	4.23
25.	RIN-403	23.75	10.45	101.91	9.79	8.57	17.89	2.08
26.	RIN-405	35.86	20.89	165.39	25.78	19.57	39.16	4.65
S.Ed		0.881	0.412	2.208	0.404	0.360	0.680	0.073
CD (p = 0.05)		2.50	1.17	6.27	0.36	1.02	1.93	0.21

Table 3: *Per se* performance of 26 genotypes of vegetable Mesta for important biochemical characters

S. No.	Genotypes	Calcium (mg)	Iron (mg)	Protein (%)	Leaf fibre content (g)	Ascorbic acid content (mg)
1.	RIN-40	165.58	5.98	10.62	4.64	52.34
2.	RIN-92	166.39	5.22	10.81	4.71	52.76
3.	RIN-93	162.36	6.12	10.00	4.35	48.69
4.	RIN-97	176.49	6.05	10.12	5.99	59.92
5.	RIN-99	168.03	7.08	11.12	4.87	53.62
6.	RIN-100	160.27	5.17	9.56	4.15	50.12
7.	RIN-102	167.22	5.90	10.94	4.79	53.19
8.	RIN-105	174.77	5.28	8.87	5.54	46.29
9.	RIN-107	164.71	6.72	10.50	4.56	51.92
10.	RIN-166	163.16	7.15	10.19	4.42	50.09
11.	RIN-276	175.63	5.58	7.75	5.63	52.68
12.	RIN-280	168.86	5.69	11.31	4.95	54.05
13.	RIN-281	177.37	5.24	8.12	5.81	58.57
14.	RIN-282	163.96	6.25	10.31	3.68	38.50
15.	RIN-287	179.12	7.12	11.18	5.22	59.90
16.	RIN-305	171.37	7.56	11.25	5.19	55.37
17.	RIN-340	163.25	6.22	9.37	5.10	49.05
18.	RIN-351	173.92	5.42	11.12	5.45	52.56
19.	RIN-352	162.77	6.21	11.69	4.21	50.17
20.	RIN-355	178.241	7.68	11.44	5.91	58.68
21.	RIN-356	177.12	5.36	11.12	4.86	50.66
22.	RIN-359	169.71	6.25	10.68	5.63	54.48
23.	RIN-361	173.06	5.42	9.87	5.36	52.56
24.	RIN-362	172.55	7.06	8.06	5.11	54.93
25.	RIN-403	161.56	6.98	9.75	4.28	50.28
26.	RIN-405	172.22	5.82	9.69	5.64	51.82
S.Ed		0.325	0.223	0.066	0.032	0.158
CD (p = 0.05)		0.87	0.63	0.19	0.09	0.45

the seasons. Highly significant variations among the genotypes for the characters *viz.*, calcium, iron, ascorbic acid content, nitrogen, protein, leaf fibre content, TSS, reducing and non reducing sugar was also recorded during summer season. Among the 26 genotypes studied the genotype RIN 287 performed well. It had recorded highest leaf yield per plant and its component characters followed by the genotype RIN 352 and RIN 356. The genotype RIN 287 also recorded highest calcium content. Ascorbic acid content was highest in genotype RIN 97 followed by the genotype RIN 287 and RIN 351. Considering the leaf yield and other component characters, the genotype RIN 287, RIN 356 and RIN 352 have showed a superior performance and also they have recorded highest quality parameters. Similar results were obtained by Vishnuwardhana (1993) for leaf length, fresh weight of leaf and dry weight of leaf in palak, Vaidya (1984) in amaranthus for leaf length, leaf width and number of leaves per plant in Amaranthus and Arunkumar (1985) for number of leaves and size of leaf in Mesta. The high yielding genotypes RIN 287, RIN 356, RIN 281 and RIN 352 could be used in large scale for green production.

References

Arunkumar, S.K. (1985). Genetic divergence studies in mesta (*Hibiscus sabdariffa*). M.Sc. (Agri.) Thesis, University of Agricultural sciences, Bangalore.

Narayanreddy, M.A., P. Muddappagouda and K.V. Devar (1990). Seema pundit. In Soppu Tarakarigalu, Kannada Adyayana Vibhaga Publications, University of Agricultural Sciences, Bangalore, pp. 78-83.

Vaidya, K.R. (1984). Genetic variation in land race populations of Indian Amaranthus. *Indian J. Agric. Sci.,* **47:** 365-369.

Vishnuvardhana (1993). Genetics of yield and quality traits in Palak (*Beta vulgaris* var. *Bengalnesis* L.). M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore.