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Swarna Kapoori: A New Promising Betelvine variety

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Fifty one genotypes of Betelvine were collected and maintained as gene bank at Bapatla. Best performing six genotypes *viz.* Safed Utukuru, Kapoori Chittikavata, Shirpurkata, Vasani Kapoori, Swarna Kapoori and Local cultivar in the gene bank were selected and subjected for further testing under varietal evaluation during 2001-03. Of these, Swarna Kapoori was found promising and forwarded to on-farm and multi-location testing in different districts of Andhra Pradesh. The yield increase was 20% in Swarna Kapoori compared to local check and the same was recommended for release.

Key words: Betelvine, stimulant, variety, dioecious, cash crop

Betelvine (*Piper betle L.*) is a leaf yielding perennial dioecious evergreen creeper grown in India. It is a chewing stimulant. It is also an important cash crop grown throughout India in about 55,000 ha and largely grown in the states of Andhra Pradesh, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal (Guha, 2006). India is also said to be the largest producer of betel leaves in the world (Arulmozhiyan *et al*., 2005). In Andhra Pradesh, Betelvine occupies an area of 2843 ha and chiefly cultivated in districts of Guntur, Krishna, Kadapa, Vizag, Ananthpur, Nellore, Medak, Kurnool, East and West Godavari. The betelvine crop being highly labour intensive becomes a perennial source of employment and offers day to day income to the farmers. In recent times, the betel leaf yield is getting depleted due to lack of availability of superior variety producing high number of laterals, leaf yield and resistant to *Phytophthora* foot rot disease. Thus, the present study was concentrated in screening for high yielding variety from the existing germplasm pool for the benefit of farming community.

Material and Methods

The experiment was conducted during 1998-2008 as evaluation studies with 51genotypes collected from different parts of India through All India Coordinated Research Project on Betelvine. Juvenile rooted cuttings of 15cm length having 3-5 nodes were planted with 2-3 nodes in the soil in betelvine conservatory. Each line was raised in 3m length with spacing of 100 x 20 cm between and within the rows respectively. All the 51 genotypes collected were evaluated at the experimental farm of AICRP on Betelvine, Bapatla, A.P. Observations on vine elongation per month, number of laterals/vine, leaf yield, fresh weight of 100 leaves, keeping quality and disease reaction were recorded. Based on the evaluation, the best performing six genotypes Safed Utukuru, Kapoori Chittikavata, Shirpurkata, Vasani Kapoori, Swarna Kapoori and Local cultivar were selected from the genepool and tested under varietal trial during 2001- 2003. Later, the promising variety with respect to vine length, number of laterals and harvestable leaves was identified and forwarded to on-farm and multi-location testing over the state.

Results and Discussion

Swarna Kapoori is the selection from Vasani Kapoori, variety of Maharashtra. Growth attributes like vine elongation per month (41.25) and Number of laterals per vine (22.37) recorded higher in genotype Swarna Kapoori when compared to other genotypes (Table 1). The disease incidence (i.e) *Phytophthora* foot rot was found lesser in Swarna Kapoori than any other genotype under study (Table 2). The shelf life of leaf ranged from 9 to 12 days (Table 3). The intensity of deterioration of leaf varied with genotypes. It may be due to the difference in enzymatic reactions, fiber content in leaf etc. (Pariari *et al*., 2008). The observation was also supported by Saikia *et al*., (1993), who reported that storage life of betel leaves varied with genotype. Fresh weight of 100 leaves was also recorded higher in Swarna Kapoori in both the years 2001-02 (251 g), 2002-03 (176 g) and on an average during the period 2001-03 was 213.50g (Table 4).

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Table 1. Growth parameters of various betelvine varieties

Variety	Vineelongation per month (cm)				No .of laterals per vine			
	2001-02	2002-03	Mean	% increase of Swarna Kapoori over other varieties	2001-02	2002-03	Mean	% increase of Swarna Kapoori over other varieties
Safed Utukuru	34.25	31.25	32.75	20.60	5.75	18.25	12.00	45.45
KapooriChittikavata	35.00	36.00	35.50	13.93	6.00	26.25	16.12	26.73
ShirpurKata	34.75	32.50	33.62	18.50	4.75	25.50	15.12	31.27
Vasani Kapoori	39.75	37.75	38.75	6.06	8.75	32.25	20.50	6.82
Local Cultivar	34.50	30.00	32.25	21.82	6.00	18.75	12.37	43.77
Swarna Kapoori	42.00	40.50	41.25	—	9.00	35.75	22.00	—
SEM ±	0.76	1.49			0.71	1.31		
C.D(P=0.05)	2.29	4.45			2.13	3.95		
CV(%)	4.14	3.56			21.33	4.38		

The average leaf yield of Swarna Kapoori was 72.44 lakh leaves/ha compared to other genotypes tested during the period 2001-03 under varietal evaluation trial. The yield of Swarna Kapoori was significantly higher over other genotypes. The percentage increase in leaf yield over other varieties ranged from 9.84 to 48.3 (Table 4). Similarly, 18 on farm testing and 11 multi location trials in farmer's field of different districts were conducted comparing Swarna Kapoori variety with the local ruling check. Swarna Kapoori excelled the local check in yield, exhibiting 20-25% increase over check (Table 5). The increased yield might be attributed to the increased vine length and number of laterals.

Table 2. Incidence of *Phytophthora* foot rot disease in various betelvine varieties

Variety	Incidence of Phytophthora foot rot disease (Transformed value)			Incidence of Phytophthora foot rot disease (%)		
	2001-02	2002-03	Mean	2001-02	2002-03	Mean
Safed Utukuru	14.00	26.50	20.25	22.00	29.33	25.66
Kapoori Chittikavata	17.00	22.25	19.62	24.35	31.31	27.83
ShirpurKata	14.50	28.75	21.62	22.46	33.83	28.14
Vasani Kapoori	8.25	23.75	16.00	16.25	27.97	22.11
Local Cultivar	15.75	40.50	28.12	23.50	40.40	31.95
Swarna Kapoori	7.00	16.75	11.87	15.34	27.97	21.65
SEM ±	—	—	—	0.95	1.54	
C.D(P=0.05)	—	—	—	2.86	4.65	
CV(%)	—	—	—	9.24	10.10	

Table 3. Shelf life of various betelvine varieties

Variety	Keeping quality (No. of days at 50% rotting)		
	2001-02	2002-03	Mean
Safed Utukuru	9.25	11.25	10.25
Kapoori Chittikavata	10.0	11.25	10.62
ShirpurKata	9.75	11.00	10.37
Vasani Kapoori	10.50	11.75	11.12
Local Cultivar	10.50	11.00	10.75
Swarna Kapoori	12.00	12.00	12.00
SEM ±	0.40	0.37	
C.D(P=0.05)	1.21	NS	
CV(%)	7.71	5.30	

Table 4. Yield parameters of various betelvine varieties

Variety	Leaf yield (No. of leaves in lakhs/ha)				Fresh Wt. of 100 leaves (grams)			
	2001-02	2002-03	Mean	% increase of Swarna Kapoori over other varieties	2001-02	2002-03	Mean	% increase of Swarna Kapoori over other varieties
Safed Utukuru	30.75	44.13	37.44	48.31	213	152.00	182.50	14.52
KapooriChittikavata	36.00	51.75	43.87	39.44	208	141.00	174.50	18.27
ShirpurKata	29.00	47.38	38.19	47.28	207	152.00	179.50	15.92
Vasani Kapoori	46.25	84.38	65.31	9.84	243	171.00	207.00	3.04
Local Cultivar	30.00	49.25	39.62	45.31	203	148.00	175.50	17.80
Swarna Kapoori	51.25	93.63	72.44	—	251	176.00	213.50	—
SEM ±	2.11	2.27			3.54	2.11		
C.D(P=0.05)	6.36	6.84			10.67	6.36		
CV(%)	11.32	7.35			3.31	2.70		

Table 5. Performance of Swarna Kapoori in Multi Location Trials and On-Farm Testing in Andhra Pradesh state during 2003-2008

S.No.	Village Name	Mandal	District	No.of laterals		Yield		% increase over check
				Swarna Kapoori	Check	Swarna Kapoori	Check	
2003-04								
1.	Gosal - I	Penamaluru	Krishna	11	6	44.00	25.30	20
2004-05								
2.	Gosal - II	Penamaluru	Krishna	17	11	49.00	40.20	18
3.	Donepudi - I	Kolluru,	Guntur	13	7	47.3	39.00	17.02
4.	Donepudi - II	Kolluru	Guntur	12	5	43.00	34.00	20.9
5.	Donepudi - III	Kolluru	Guntur	11	6	45.70	36.70	20.0
6.	Machavarm-I	Ponnuru	Guntur	14	6	48.00	37.28	22.9
2005-06								
7.	Vanukuru,	Penamaluru	Krishna	12	8	47.00	36.00	23
8.	Gosala - III	Penamaluru	Krishna	11	7	40.00	32.00	20
9.	Kasukarru	Ponnuru	Guntur	12	6	46.28	37.00	19.5
10.	Epuru - I	Tenali	Guntur	12	6	49.0	36.47	26.53
11.	Epuru - II	Tenali	Guntur	12	7	47.83	37.00	21.27
12.	Chilumuru - I	Tenali	Guntur	11	7	48.28	37.92	22.91
2006-07								
13.	K. V. Palem	Kankipadu,	Krishna	14	8	41.00	33.00	19
14.	Madduru	Kankipadu,	Krishna	17	11	48.00	40.00	16
15.	Kasukarru	Kankipadu	Guntur	11	5	45.00	33.1	26.6
16.	Gandiguntala - I	Kankipadu	Krishna	12	6	47.35	35.71	25.53
17.	Gandiguntala - II	Vuyyuru	Krishna	12	7	47.45	36.25	33.40
18.	Chinna Ogurala – I	Vuyyuru	Krishna	11	6	48.55	35.75	27.08
19.	Chinna Ogurala – II	Vuyyuru	Krishna	12	7	45.00	34.00	24.44
20.	Chinna Ogurala - III	Vuyyuru	Krishna	12	6	44.00	34.60	22.72
2007-08								
21.	Godavarru	Kankipadu	Krishna	11	6	35.00	28.00	20
22.	Vanukuru,	Penamaluru	Krishna	14	9	46.00	38.00	17
23.	Chintalapudi - I	Ponnuru	Guntur	11	8	43.00	36.00	16.27
24.	Chintalapudi – II	Ponnuru	Guntur	12	7	44.00	35.78	20.45
25.	Chintalapudi - III	Ponnuru	Guntur	14	8	48.00	38.00	20.83
26.	Nidubrolu	Ponnuru	Guntur	14	8	49.00	40.24	18.36
27.	Chintalapudi	Ponnuru	Guntur	12	7	43.34	38.00	11.63
28.	Mahabubabad	Mahabubabad	Warangal	13	5	44	35.21	20.45

Conclusion

The results obtained from evaluation of betelvine germplasm, on farm and multi location testing made the National Group Meeting Council of AICRP on MAP and Betelvine to recommend the betelvine variety Swarna Kapoori for the release in state of Andhra Pradesh.

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