Indian J. Plant Genet. Resour. 27(3): 277-279 (2014)
DOI 10.5958/0976-1926.2014.00026.6

SHORT COMMUNICATION

Evaluation of F_2 Population Derived from *Cucumis melo* var. *momordica* X *C. melo* var. *reticulatus* in Konkan Region based on Morphological Characters

PV Patil[1], MB Magdum[2] and DK Kulkarni[3]
[1]*Rajgad Dnyanpeeth, Anantrao Thopte College, Bhor, Pune-412206, Maharashtra*
[2]*Head, Department of Horticulture, Dr Balasaheb Savant Konkan Krishi Vidyapeeth, Dapoli-415712, Ratnagiri, Maharashtra*
[3]*BAIF Development Research Foundation, Pune-411058, Maharashtra*

(Received: 16 January 2013; Revised: 03 December 2014; Accepted: 11 December 2014)

The present investigation was aimed for assessing the morphological parameters of the F_2 population of 10 promising hybrids between snap melon and musk melon. The hybrids $SM_2 \times MM_4$ and $SM_5 \times MM_2$ were found to be promising for plant architecture, yield and attractive golden fruit colour. The hybrid $SM_1 \times MM_4$ can be rated extremely well for yield. The component characters recorded may be utilized for developing desirable plant type.

Key Words: Evaluation, F_2 population, Morphological characters, Snap melon, Tribal food

Tribal people cultivate various cucurbits for their day to day needs in Kitchen garden. The genetic variability among cucurbits is still ambiguous (Kulkarni and Kumbhojkar, 2004). Indian scientists have carried out research on *Cucumis melo* and wide variability of dessert melons as well as non-dessert (non-sweet) forms and land races were found in India. Phoot or Chibud commonly known as Snapmelon [*Cucumis melo* L. var. *momordica* (Roxb.) Duthie & J.B. Fullar] is an important vegetable cum fruit in tribal region of Konkan. Germplasm collection of this species and their scientific evaluation pertaining to morphological variation and qualitative and quantitative characters of F_2 population is essential for development of desired character combinations (Patil, 1994). Seshadri and More (2008) have carried out research on *Cucumis melo* var. *momordica* Duthie & Fullar for resistance to powdery mildew (*Sphaerotheca fuliginea*), downy mildew (*Pseudoperonspora cubensis*) and *Cucumber green mottle mosaic virus* (CGMMV). There are cucumber-like forms (used as salad) with crisp flesh like Kakri (*Cucumis melo* var. *utilissimus* Duthie & Fullar) from North India and Vellarikkai (or Vellarikkaya) and Vellari of South India (Sheshadri, 1991). These valuable forms are important food resources of local people.

The genus *Cucumis* (Cucurbitaceae) comprises about 30 species and is of great economic importance (Kirkbride, 1973). *Cucumis melo* var. *momordica* are widely grown by tribal communities for their edible fruits used both as vegetable and fruits. However, the crop is least attended and remained unexploited. Variability studies have indicated scope for improving the quality aspects, plant architecture and season insensitivity (Deshmukh, 1991). In another study, it has been revealed that the snap melon can be freely crossed with muskmelon, thereby providing a scope for inducing the quality aspects like non cracking behavior which is a severe problem of snap melon and seasonal insensitivity (Datta and Nath, 1969). Krishna Reddy *et al*. (2005) studied genetic and biochemical parameters in introduced and indigenous germplasm in snap melon. Such a distant crossing is expected to create a great degree of variability, which is a basis for success of further breeding programmes. When six lines of snap melon were crossed with four testers of musk melon good combining ability for important traits was observed. Therefore, the present investigation was undertaken to evaluate the F_2 with desirable plant types suitable for *kharif* season cultivation in Konkan region.

Seeds of 10 promising hybrids of snap melon × musk melon, namely, '$SM_1 \times MM_4$', '$SM_2 \times MM_2$', '$SM_2 \times MM_3$', '$SM_2 \times MM_4$', '$SM_5 \times MM_2$', '$SM_5 \times MM_3$', '$SM_5 \times MM_4$', '$SM_6 \times MM_2$', '$SM_6 \times MM_3$', '$SM_6 \times MM_3$', '$SM_6 \times MM_4$' were selected. The experiment was laid out in a compact family block design, with two replications. The experimental conditions were

tropical climate, laterite soil of pH 5.6 to 6.5 with good drainage and high humidity. The distance between plant to plant was 1 meter and row to row was 0.75 meter. The nutrients were applied (N:P:K) at the rate of 80, 50 and 30 kg/ha, as urea, single super phosphate and muriate of potash, respectively. Plant protection measures were applied as per requirement. The fruits of F_2 population were harvested at full ripe stage (full maturity). The data on quantitative aspects were recorded for each hybrid. Present study encompasses characters like stem length, number of branches, leaf area, fruit development period, first fruit initiation, length and diameter of fruits, flesh thickness, edible portion and total yield/vine.

Statistical analysis was done in two stages first form the main plot values, the variance between families and corresponding error was calculated in second, treating the experiment as one in simple randomized block (Panse and Sukhatme, 1967).

Formation of a population with genetic variability for the characters of interest is a pre-requisite for crop improvement programme. Genetic improvement mainly depends upon the amount of genetic variability present in a population. The mean values of hybrids for different characters of growth, yield and a quality is mentioned in Table 1.

The overall mean showed maximum variation within the progenies. Hybrids $SM_1 \times MM_4$ showed maximum vine length of 399.80 cm followed by those belonging to $SM_6 \times MM_4$ (377.80 cm.). The progenies of $SM_2 \times MM_3$ attributed minimum average vine length 250 cm. It was observed that number of primary branches of $SM_1 \times MM_4$ was 10.70 followed by 9.80 in $SM_2 \times MM_4$. The lowest number of branches (7.00) were noticed in hybrid SM6 × MM4. The highest mean performance for total number of branches/vine was exhibited by $SM_1 \times MM_4$ (25.60) followed by $SM_2 \times MM_4$ (23.60) and $SM_2 \times MM_2$ (21.00). The lowest performance was noticed in $SM_6 \times MM_4$ (16.70). The highest average leaf area/vine was recorded in the hybrid $SM_1 \times MM_4$ (412.16 dm^2/vine). It was lowest in the hybrid $SM_6 \times MM_2$ (165.49 dm^2/vine). Highest performance in secondary branches (14.90) was recorded in hybrid $SM_1 \times MM_4$. The number of secondary branches/vine is the principle determinants of number of fruits/vine and hence the fruit yield/vine in cucurbits (Nath and Vashistha, 1969, 1970; Moon, 1989). The hybrid means for fruit development period ranged between 27.3 in $SM_5 \times MM_2$ to 36 days in $SM_6 \times MM_2$. Considering shorter fruit development period as a criteria for selection hybrid $SM_5 \times MM_2$ may be considered as most promising. The hybrid $SM_5 \times MM_4$ recorded maximum average fruit length (18.80 cm) followed by those belonging to hybrid $SM_5 \times MM_3$ (16.15 cm). The hybrids $SM_2 \times MM_3$ showed

Table 1. Mean values of F_2 population of Snapmelon cross

S. No.	Family	Main stem length (cm)	No. of primary branches/ vine	No. of secondary branches/ vine	Total no. of branches/ vine	Leaf area (dm^2)/ vine	Fruit devp. period in days	Days to first fruit	Average length of fruit (cm)	Average diameter of fruit (cm)	Flesh thickness of fruit (cm)	Edible portion in %	Average weight of fruit (kg)	Total yield/ vine (kg)
1	SM1 × MM4	399.8	10.7	14.9	25.6	412.16	29.5	91.8	13.91	9.44	2.73	86.2	1.015	3.87
2	SM2 × MM2	317.7	9.1	11.9	21	284.31	29.7	91	14.16	8.69	2.97	85.64	0.852	2.376
3	SM2 × MM3	250	8.3	9.9	18.2	204.83	30.5	88.1	12.07	8.17	3.13	83.71	0.527	1.291
4	SM2 × MM4	361.75	9.8	13.8	23.6	205.12	29.5	87.6	14.01	9.96	3.2	85.29	0.878	1.953
5	SM5 × MM2	326.25	8.5	12.2	20.7	219.82	27.3	86.1	13.15	10.09	3.27	86.45	0.954	2.489
6	SM5 × MM3	342.8	8	11.4	19.4	215.95	32.1	89.8	16.15	10.96	3.23	86.43	1.216	2.786
7	SM5 × MM4	371.5	9.5	10.8	20.3	265.76	31.7	91.8	18.8	9.49	3.06	84.86	1.046	2.104
8	SM6 × MM2	326.8	7.7	10.5	18.2	162.49	36	9.8	12.72	8.88	2.58	89.67	0.783	1.094
9	SM6 × MM3	351.4	7.7	10.6	18.3	253.2	35.2	92.8	15.16	9.68	2.9	89.02	0.829	1.287
10	SM6 × MM4	377.8	7	9.7	16.7	254.2	33.1	95.2	14.28	10.54	3.48	88.71	0.968	1.577
	Avg. Mean of Hybrids	342.58	9.5	11.57	20.2	247.78	31.5	90.8	14.44	13.56	3.05	87.38	0.907	1.983
	Avg. Mean of Parents	333.14	9.5	14.68	21.07	333.7	31.78	86.28	19.5	9.59	3.26	89.27	1.31	2.73

minimum average fruit length (12.07 cm). The progenies of $SM_5 \times MM_4$ may be regarded as promising as it shows maximum average fruit length. The maximum flesh thickness (3.48 cm) was noticed in hybrid $SM_6 \times MM_4$ followed by $SM_5 \times MM_2$ (3.27 cm) and $SM_5 \times MM_3$ (3.23 cm). The lowest flesh thickness was noticed in $SM_6 \times MM_2$ (2.58 cm). The flesh thickness is an important aspect related to yield of edible portion. The maximum weight of edible portion was recorded in $SM_6 \times MM_2$ (89.67) followed by $SM_6 \times MM_3$ (89.02). The highest mean performance 3.70 was exhibited by hybrid $SM_1 \times MM_4$ followed by $SM_5 \times MM_2$ (2.90) and $SM_2 \times MM_2$ (2.50) for average number of fruits. The hybrid mean 3.87 kg/ vine was recorded in $SM_1 \times MM_4$ followed by $SM_5 \times MM_3$ (2.79 kg/ vine) for total yield/vine. The lowest hybrid mean was recorded in $SM_6 \times MM_2$ (1.09 kg/vine). These hybrids may be regarded as promising types for total/ vine yield.

Acknowledgements

Authors are thankful to Mr GG Sohani, President, BAIF Development Research Foundation, Pune. Authors are also thankful to Head, Department of Horticulture, College of Agriculture, Dr Babasaheb Savant Konkan Krishi Vidyapeeth, Dapoli, for providing facilities for conducting experiment and to Dr SP Taware for editorial corrections.

References

Datta OP and P Nath (1969) Crossability in melons. *Indian J. Hort*. **27**: 60-67.

Deshmukh AV (1991) Evaluation of germplasm in snapmelon (*Cucumis melo* var. *momordica* Duthie & Fullar) M.Sc. (Agri.) Thesis submitted to Konkan Krsihi Vidyapeeth, Dapoli, Maharashtra (Unpublished).

Kirkbride JH (1993) *Biosystematic monograph of the genus Cucumis* (Cucurbitaceae), Parkway, Boone, N.C.

Krishna Reddy AN, A D Munshi, TK Behera and C Kaur (2005) Studies on genetic and biochemical parameters of introduced and indigenous germplasm in snap melon (*Cucumis melo* L. var. *momordica* Duth, and full.) *Indian J. Plant Genet. Resour.* **18**: 91-93.

Kulkarni DK and MS Kumbhojkar (2004) Plant conservation in Maharashtra during 17th Century. *Asian Agri-History* **8**: 179-188.

Moon GM (1989) Genetic variability and correlation studies in Ridgegourd (*Luffa acutangula* Roxb.) M.Sc. (Agri.) Thesis submitted to Konkan Krishi Vidyapeeth, Dapoli, (Unpublished)

Nath P and RN Vashistha (1969) Studies on vegetative growth, flowering pattern, fruit set and fruit development in *Citrullus lanatus* Thumb Mansf. *Indian J. Hort*. **26**: 51-58.

Nath P and RN Vashistha (1970) Studies on vegetative growth, flowering pattern, fruit set and fruit development in snapmelon *Cucumis melo* var. *momordica*). *Indian J. Hort*. **27**: 181-184.

Panse VG and PV Sukhatme (1967) *Statistical methods for Agricultural worker*. (2nd Edition, New Delhi, ICAR) pp 245-250.

Patil PV (1994) Evaluation of F_2 population of Snapmelon (*Cucumis melo* var. *momordica* Duthie & Fullar) × Muskmelon (*Cucumis melo* var. *reticulatus*) M.Sc.(Agri.) in Horticulture Dissertation submitted to Konkan Krishi Vidyapeeth, Dapoli. (Unpublished).

Seshadri VS (1991) Vegetable production in India – Some constrains and managerial remedies. Recent advances in tropical vegetable production. Kerala Agricultural University, Thrissur.

Seshadri VS and TA More (2008) Indian land races in *Cucumis melo.* II International Symposium on Cucurbits (Abstract) *Acta Hortic.* 588.