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Evaluation of muskmelon (*Cucumis melo* L.) genotypes (parents and their crosses) for quantitative and qualitative traits under temperate conditions of Kashmir

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Abstract
The present investigation was carried out at Vegetable Experimental Field, Division of Vegetable Science, SKUAST-Kashmir Shalimar during kharif 2021-22. The twelve parents of muskmelon along with their sixty-six crosses were evaluated for maturity, yield attributing and quality traits for identifying genotypes with high yielding ability and better quality. The result revealed that significant variations were found among the genotypes for the traits studied. The maximum performance for yield per plant and per hectare was observed in parent SKAU-MM-701 (4.73 kg/plant, 210.20 q/ha) followed by SKAU-MM-705 (4.64 kg/plant, 206.20 q/ha) and SKAU-MM-711 (4.46 kg/plant, 198.35 q/ha). Similarly maximum yield in crosses was observed in SKAU-MM -701 × SKAU-MM-702 (5.35 kg /plant, 237.90 q/ha) followed by SKAU-MM-701 × SKAU-MM-712 (5.31 kg/plant, 235.97 q/ha) and SKAU-MM -701 × SKAU-MM-708 (5.28 kg/plant, 234.78 q/ha). For quality traits maximum TSS content was observed in parents SKAU-MM -706 (10.5˚B) followed by SKAU-MM -701 (9.4˚B) and in crosses (SKAU-MM -701 × SKAU-MM-702 (12.2˚B) followed by SKAU-MM-702 × SKAU-MM-706 (11.9˚B). Thus overall evaluation of muskmelon parents and crosses showed that significant variation was present thereby indicating scope of improvement of this material through various breeding methods.

Keywords: Muskmelon, performance, quality, yield, mean, improvement

Introduction
Muskmelon (*Cucumis melo* L.) (2n=24) belongs to the family cucurbitaceae. Edible melons belong to either *Cucumis melo* var. *reticulatus* or *Cucumis melo* var. *cantaloupensis.* Plants are either monoecious or andromonoecious annuals with long trailing vines and shallow lobed round leaves. There is considerable variation in fruit size and shape. External appearance may be smooth with netted, the skin colour may be white, green and yellow. Muskmelon is used as dessert fruit and fruit juice has cooling effect. At green stage, it is cooked as vegetable. The fruit juice is nutritive and acts as demulcent and diuretic drink. Juice also acts as remedy for skin diseases, tan freckles and dyspepsia. The seeds are edible and its kernel is rich in oil (40-44%). This oil is useful in overcoming the problems like painful discharge and suppression of urine. The roots of melon have purgative and vomit causing properties. Fruits are good source of vitamins and minerals and relatively low in protein. The yellow and orange fleshed melons contain β-carotene and particularly cantaloupes are high in provitamin A. Most of the variation in color density are due to quantitative differences in β-carotene (Burger *et al.*, 2009) [2]. Melons are also rich in vitamin C. For every 100 g edible portion, melons provide 26 to 17 calories energy, 0.3 g protein, 32 mg calcium, 1.4 mg iron and 14 mg phosphorus (Chakrabarti, 2011) [3]. Muskmelon being monoecious is a cross pollinated crop and offers considerable variation (Kesavan and More, 1991) [8]. In melon, yield is correlated with several traits including days to anthesis, primary branch number, fruit number and average weight per fruit (Abdalla and Aboul-Nasr 2002) [1]; (Taha *et al.*, 2003) [14]. A systematic study on the evaluation of germplasm is highly warranted not only to increase the yield potential but also to improve quality traits, pests and disease resistance. Generally, muskmelon requires relatively shorter growing season with a warm climate. Sufficient variability in respect of earliness, fruit number, weight, colour, shape, size, flavour, sweetness and disease resistance is observed in

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the crop, which offers great scope for improvement of this crop through various breeding procedures.

Materials and Methods

The experimental material for present study consists of twelve diverse genotypes of muskmelon (*Cucumis melo* L.) maintained by Division of Vegetable Science, SKUAST-Kashmir, Shalimar. During kharif 2021, sixty six F1 crosses were generated through 12×12 diallel mating design (excluding reciprocals) at Vegetable Experimental Field, Division of Vegetable Science, SKUAST-Kashmir Shalimar. The set of seventy eight genotypes *viz*., sixty six crosses along with their twelve parents were evaluated in randomized complete block design at Experimental Farm, Division of Vegetable Science, SKUAST-K Shalimar, during kharif 2022. The row to row and plant to plant spacing was maintained at 1.5 m × 1.5 m. Recommended package of practices were adopted to raise a healthy crop. The observations were recorded on both quantitative as well as quality traits including node at which first female flower appears, number of primary branches plant^{-1}, days from sowing to marketable maturity, days from sowing to last fruit harvest, fruit length (cm), fruit diameter (cm), rind thickness (mm), flesh thickness (mm), average fruit weight (g), number of fruits per plant, inter nodal Length (cm), number of nodes per plant, vine length (cm), seed cavity length (cm), seed cavity diameter (cm), fruit yield plant^{-1} (kg), fruit yield hectare^{-1} (q/ha), TSS (°Brix), vitamin C content (mg/100gm), carotenoid content (mg/100 gm), titrable acidity (% citric acid) and dry matter (%).

Result and Discussion

The mean performance of twelve parents and sixty-six crosses of muskmelon for various growth, yield and yield attributing traits are presented in Table 1. The results revealed that genotypes differed significantly for all the studied traits. The estimates of mean values revealed that no genotype was superior for all the characters under study. Earliness is one of the main attribute which is measured in terms of node at which first female flower appears. The parents SKAU-MM-705 (2.4) produced female flower at lowest node followed by SKAU-MM-711(3.6), whereas in crosses SKAU-MM-704 × SKAU-MM-711 (2.6) followed by SKAU-MM-705 × SKAU-MM-707 (2.6) produced female flower at lowest node. Similar trend of earliness was reported by Rakhi and Rajamony, 2005 [12]; Hossain *et al*., 2010 [7]; Hanchinamani *et al*., 2011 [6]; and Omprasad *et al*., 2021 [9]. Maximum number of primary branches plant^{-1} was observed in parents SKAU-MM-706 (5.7) followed by SKAU-MM-708 (2.4) and in crosses SKAU-MM-702 × SKAU- MM-711(4.6) followed by SKAU-MM-703 × SKAU- MM -708 (4.5). Minimum days from sowing to marketable maturity was observed in parents SKAU-MM-712 (84.8) followed by SKAU-MM-709 (85.2), whereas in crosses SKAU-MM-704 × SKAU-MM- 711(82.4) followed by SKAU-MM-705 × SKAU- MM-707 (83.20). Days from sowing to last fruit harvest was found to be minimum in parent SKAU-MM-710 (91.8) followed by SKAU-MM-704 (93.50) and in crosses SKAU-MM-709 × SKAU-MM-712 (91.5) followed by SKAU-MM-701 × SKAU-MM-710 (91.60). Fruit length (cm) was found to be maximum in parent SKAU-MM-706 (20.2) followed by SKAU-MM-705 (15.8) whereas in crosses SKAU-MM-705 × SKAU-MM-706 (19.2) followed by SKAU-MM-705 × SKAU-MM-712 (18.5). Studies conducted by Rakhi and Rajamony, 2005 [12]; Rad *et al.,* 2010 [11] and Pandey *et al.,* 2010 [10] also observed similar trend of results for fruit length. Similarly fruit diameter (cm) was found to be maximum in parent SKAU-MM-701(13.4) followed by SKAU-MM-705 (12.6) and in crosses SKAU-MM-701 × SKAU-MM-712 (14.4) followed by SKAU-MM-701 × SKAU-MM-709 (13.6). Similar trend of results was reported by Pandey *et al.*, 2010. Maximum number of fruits plant^{-1} was observed in parent SKAU-MM-710 (6.7) followed by SKAU-708-MM (5.7) and in crosses SKAU-MM-702 × SKAU-MM-703 (5.5) followed by SKAU-MM-704 × SKAU-MM-707 (5.4). Rind thickness (mm) was found to be maximum in parent SKAU-MM-701 (9.5) followed by SKAU-MM-703(5.6), whereas in crosses SKAU-MM-701 × SKAU-MM-710 (12.3) followed by SKAU-MM-701 × SKAU-MM-704 (10.4). Flesh thickness (mm) was found to be maximum in parent SKAU-MM-708 (30.5) followed by SKAU-MM-701(30.4) and in crosses SKAU-MM-702 × SKAU-MM-706 (41.4) followed by SKAU-MM-701 × SKAU-MM-709 (40.5). This is in corroboration with the findings of Singh and Ram 2003 [13]; Rad *et al.,* 2010 [11] and Pandey *et al.,* 2010 [10]. Average fruit weight (g) was found to be maximum in SKAU-MM-701 (966.5) followed by SKAU-MM-704 (818.5). Whereas in crosses SKAU-MM-705 × SKAU-MM-706 (1136.0) followed by SKAU-MM-701 × SKAU-MM-702 (1115.5). Similar pattern of results was reported by Singh and Ram, 2003 [13]; Rad *et al.,* 2010 [11] and Pandey *et al.,* (2010) [10]. Minimum internode length was found to be in parents SKAU-MM-710 (4.8) followed by SKAU-MM-707 (5.6) and in crosses SKAU-MM-702 × SKAU-MM-704 (4.6) followed by SKAU-MM-708 × SKAU-MM-712 (5.4). Maximum number of nodes vine^{-1} was observed in parent SKAU-MM-710 (30.3) followed by SKAU-MM-703 (28.5) and in crosses SKAU-MM-703 × SKAU-MM-709 (33.3) followed by SKAU-MM-706 × SKAU-MM-707 (30.3). Maximum vine length (cm) was found in parents SKAU-MM-709 (175.4) followed by SKAU-MM-704 (170.4) and in crosses SKAU-MM-703 × SKAU-MM-712 (205.4) followed by SKAU-MM-709 × SKAU-MM-710 (200.3). Seed cavity length (cm) was found to be maximum in parent SKAU-MM-706 (15.4) followed by SKAU-MM-701 (12.7) and in crosses SKAU-MM-703 × SKAU-MM-709 (22.3) followed by SKAU-MM-703 × SKAU-MM-710 (14.4). Similarly seed cavity diameter (cm) was found to be minimum in parent SKAU-MM-711 (5.3) followed by SKAU-MM-703 (5.7) and in crosses SKAU-MM-701 × SKAU-MM-706 (4.3) followed by SKAU-MM-708 × SKAU-MM- 710 (4.4). Fruit yield plant $^{-1}$ (kg) was found to be maximum in SKAU-MM-708 (4.7) followed by SKAU-MM-701 (4.6) and in crosses SKAU-MM-701 × SKAU-MM- 702 (5.4) followed by SKAU-MM-701 × SKAU-MM-712 (5.3). Similarly for fruit yield hectare^{-1} (q) was found to be maximum in SKAU-MM-708 (210.1) followed by SKAU-MM-701 (206.2) and in crosses SKAU-MM-701 × SKAU-MM-702 (237.9) followed by SKAU-MM-701 × SKAU-MM-712 (235.9). The similar trend of result for high fruit yield was obtained by Pandey *et al*., 2010 [10], Cheema *et al*., 2011 [4] and Venkatesan *et al*., 2016 [15] in muskmelon.

Table 1: Average performance of muskmelon (*Cucumis melo* L.) genotypes (Parents and their crosses) for growth, yield and yield attributing traits

Parents	Node at which first female flower appears	Number of primary branches plant^{-1}	Days from sowing to marketable maturity	Days from sowing to last fruit harvest	Fruit length (cm)	Fruit diamter (cm)	Number of fruits plant^{-1}	Rind thickness (mm)	Flesh thickness (mm)	Average fruit weight (g)	Inter nodal length (cm)	Number of nodes vine^{-1}	Vine Length (cm)	Seed cavity length (cm)	Seed cavity diameter (cm)	Fruit yield plant^{-1}	Fruit yield hectare $^{-1}$
SKAU-MM-701	4.3	4.7	86.3	104.7	15.7	13.4	4.8	9.5	30.4	966.5	8.8	22.7	140.6	12.7	7.7	4.64	206.20
SKAU-MM-702	3.7	3.6	88.4	101.7	13.5	11.7	4.7	5.5	22.4	903.0	8.6	24.6	165.6	9.3	6.4	4.24	188.27
SKAU-MM-703	3.8	3.5	90.4	107.2	12.5	11.4	5.2	5.7	25.5	859.0	7.5	28.5	151.4	8.7	7.6	4.46	198.35
SKAU-MM-704	5.0	4.6	87.5	93.5	13.6	12.5	4.8	2.8	29.4	918.5	8.5	21.4	140.6	9.4	7.3	4.41	195.98
SKAU-MM-705	2.5	5.1	86.4	102.7	15.8	12.6	4.2	3.6	22.5	349.0	10.4	25.3	170.4	9.7	5.7	1.46	65.03
SKAU-MM-706	5.1	5.7	86.4	97.4	20.2	10.5	4.7	4.5	20.6	904.0	6.7	23.3	146.4	15.4	6.3	4.25	188.87
SKAU-MM-707	4.3	3.9	85.7	101.4	8.4	10.5	3.7	2.6	20.7	451.0	5.7	24.5	157.5	5.6	6.4	1.66	73.92
SKAU-MM-708	3.7	5.4	85.7	106.2	11.4	12.4	5.7	2.7	30.5	829.0	7.4	24.4	128.7	7.4	5.7	4.73	210.20
SKAU-MM-709	3.8	3.5	85.2	99.6	10.4	12.4	3.2	2.5	30.4	744.0	8.4	25.6	175.4	6.3	7.4	2.38	105.61
SKAU-MM-710	5.3	4.1	91.6	91.8	9.7	9.5	6.7	2.6	10.4	421.0	4.8	30.3	145.3	7.4	6.7	2.82	125.32
SKAU-MM-711	3.6	3.5	86.3	101.2	11.3	9.5	5.2	2.0	22.6	457.0	8.6	20.4	157.1	7.7	5.3	2.38	105.47
SKAU-MM-712	4.9	4.4	84.8	95.2	9.5	11.2	4.8	2.0	20.6	608.0	10.5	23.3	140.7	6.6	7.6	2.91	129.46
Crosses																	
SKAU-MM-701× SKAU-MM-702	4.7	3.5	86.3	104.5	18.0	13.4	4.8	10.3	30.4	1115.5	7.6	19.4	120.6	13.3	8.3	5.35	237.75
SKAU-MM-701× SKAU-MM-703	3.3	3.2	86.4	92.6	13.3	9.4	3.8	4.5	20.5	545.3	8.6	26.3	141.4	9.2	4.7	2.05	87.91
SKAU-MM-701× SKAU-MM-704	3.6	4.1	85.3	91.8	13.1	12.3	4.4	10.4	20.4	1018.2	8.4	27.2	159.3	10.3	5.4	4.48	199.09
SKAU-MM-701× SKAU-MM-705	3.4	3.7	85.5	109.5	13.4	11.4	4.2	8.3	23.5	687.0	8.5	25.4	125.5	10.7	7.7	2.88	128.10
SKAU-MM-701× SKAU-MM-706	4.6	4.0	87.3	105.3	18.4	10.5	4.2	10.4	25.5	1017.2	5.9	23.4	128.5	12.4	4.3	4.27	189.75
SKAU-MM-701× SKAU-MM-707	3.4	3.0	90.4	107.3	15.6	11.6	3.5	6.3	22.5	647.0	7.0	24.3	138.3	9.7	8.5	2.24	99.69
SKAU-MM-701× SKAU-MM-708	3.9	3.7	91.3	105.6	15.1	12.4	5.2	10.4	30.4	1016.0	7.6	22.4	140.4	12.5	7.4	5.28	234.64
SKAU-MM-701× SKAU-MM-709	4.4	3.5	85.6	92.8	15.4	13.6	4.5	5.3	40.5	1023.4	9.4	19.6	130.3	10.4	5.3	4.61	205.16
SKAU-MM-701× SKAU-	5.2	3.7	88.3	91.6	15.3	13.6	4.2	12.3	20.6	965.7	8.8	20.5	115.7	13.3	5.3	4.09	181.46

MM-710																	
SKAU-MM-701× SKAU-MM-711	4.4	3.5	88.3	98.2	15.2	12.6	5.2	5.3	20.4	1010.8	7.5	19.7	142.5	11.3	6.3	5.25	233.31
SKAU-MM-701× SKAU – MM-712	3.5	3.8	87.5	94.6	14.5	14.4	5.1	8.3	25.4	1041.8	6.6	26.5	154.4	11.7	6.6	5.31	235.97
SKAU-MM-702× SKAU-MM-703	4.1	4.1	90.3	110.5	12.7	12.2	5.5	10.4	25.7	854.0	6.7	22.5	150.3	8.7	5.7	4.69	208.42
SKAU-MM-702× SKAU-MM-704	4.4	3.4	88.3	105.2	13.5	10.6	2.7	6.3	25.4	826.0	4.6	20.5	120.7	10.7	7.4	2.23	98.95
SKAU-MM-702× SKAU-MM-705	3.5	4.4	84.6	108.4	12.5	13.4	4.6	9.4	30.5	978	7.4	25.5	150.4	11.3	8.3	4.5	199.53
SKAU-MM-702× SKAU-MM-706	4.5	3.3	85.6	97.6	17.4	11.6	5.0	8.5	41.4	1051.0	9.3	24.3	120.6	11.6	5.6	5.25	233.31
SKAU-MM-702× SKAU-MM-707	4.6	3.6	90.2	96.2	12.4	12.4	5.0	7.2	25.4	886.7	8.6	18.5	120.5	9.5	7.3	4.43	196.86
SKAU-MM-702× SKAU-MM-708	5.1	3.5	88.6	109.6	14.3	11.5	4.2	5.1	20.4	961.7	7.5	21.5	130.4	12.4	7.7	4.04	179.24
SKAU-MM-702× SKAU-MM-709	4.5	4.5	91.6	106.3	13.0	11.5	5.4	9.2	25.6	845.0	11.4	18.6	161.3	8.6	5.4	4.56	202.64
SKAU-MM-702× SKAU-MM-710	3.2	3.2	88.4	97.7	14.4	13.6	4.7	3.2	30.5	1035.1	7.5	20.4	140.4	10.7	7.6	4.86	216.1
SKAU-MM-702× SKAU-MM-711	3.7	4.6	91.3	105.3	11.8	11.4	5.2	4.3	22.4	910.3	7.6	21.5	130.6	10.3	8.4	4.73	210.20
SKAU-MM-702× SKAU-MM-712	3.1	3.3	90.5	97.6	13.4	13.5	4.4	2.3	20.5	985.0	8.7	20.7	145.3	11.4	6.6	4.33	192.42
SKAU-MM-703× SKAU-MM-704	4.4	3.2	90.2	103.4	12.6	11.7	3.7	8.2	28.4	669.0	6.7	18.4	168.3	9.7	6.7	2.47	109.76
SKAU-MM-703× SKAU-MM-705	5.5	3.0	87.4	101.4	11.3	9.6	4.0	10.3	20.6	505.0	6.7	19.7	140.4	7.7	4.7	2.02	89.62
SKAU-MM-703× SKAU-	3.5	4.0	91.4	106.3	12.4	10.3	5.2	10.4	28.5	847.0	6.7	25.4	155.3	11.5	5.5	4.30	195.53

MM-706																	
SKAU-MM-703× SKAU-MM-707	5.4	4.1	85.3	110.5	12.6	9.6	4.7	6.4	18.6	742.0	7.4	21.5	147.4	8.6	5.8	3.51	155.98
SKAU-MM-703× SKAU-MM-708	3.5	4.5	88.3	103.6	14.3	11.4	4.4	4.4	25.4	1043.0	7.4	29.4	135.5	9.4	5.7	4.62	205.53
SKAU-MM-703× SKAU-MM-709	4.6	3.2	87.5	96.5	12.7	13.3	4.6	3.4	20.7	1021.0	6.6	33.3	174.4	22.3	7.4	4.69	208.42
SKAU-MM-703× SKAU-MM-710	5.6	2.8	87.2	98.4	17.3	11.4	4.6	7.2	30.5	885.0	5.9	24.5	140.4	14.4	6.3	4.07	180.72
SKAU-MM-703× SKAU-MM-711	5.3	4.2	85.4	102.4	11.4	10.2	4.8	5.4	20.6	523.7	9.4	19.5	127.5	7.7	5.7	2.49	110.80
SKAU-MM-703× SKAU-MM-712	4.4	3.3	90.4	101.5	12.3	11.3	4.7	9.3	20.4	741.0	7.7	27.4	205.4	8.4	5.5	3.45	153.31
SKAU-MM-704× SKAU-MM-705	3.5	3.6	91.2	104.5	14.1	10.6	3.7	2.3	30.4	602.0	9.5	17.6	117.4	8.3	5.6	2.23	98.80
SKAU-MM-704× SKAU-MM-706	3.5	3.4	83.4	97.4	13.4	11.6	4.7	2.3	23.5	674.0	7.7	22.3	160.3	6.7	5.7	3.17	140.58
SKAU-MM-704× SKAU-MM-707	3.0	3.4	85.3	105.2	11.1	9.4	5.5	2.4	22.6	519.0	7.7	25.5	165.2	6.4	5.7	2.83	125.91
SKAU-MM-704× SKAU-MM-708	4.5	3.0	84.7	107.8	12.7	10.4	4.2	2.5	25.5	465.0	6.8	24.5	158.4	7.0	6.7	1.95	86.65
SKAU-MM-704× SKAU-MM-709	3.5	3.3	85.7	92.2	14.2	11.4	4.3	2.4	30.3	634.0	8.4	22.6	181.2	4.7	6.4	2.70	120.13
SKAU-MM-704× SKAU-MM-710	5.1	3.4	88.6	105.6	13.5	13.2	4.2	2.4	30.4	824.0	8.7	20.7	157.5	7.6	6.3	3.43	152.42
SKAU-MM-704× SKAU-MM-711	2.6	3.9	82.4	93.3	9.6	9.6	4.3	3.3	25.4	384.0	7.5	23.5	153.5	5.7	6.2	1.53	73.62
SKAU-MM-704× SKAU-MM-712	4.4	3.5	83.4	102.5	16.3	11.7	4.6	1.7	20.7	453.0	7.4	24.3	155.5	9.7	5.4	2.08	95.95
SKAU-MM-705× SKAU-	4.2	4.0	87.4	101.4	19.3	13.3	4.2	1.9	20.4	1136.0	8.6	22.4	158.3	12.7	7.7	4.77	211.68

MM-706																	
SKAU-MM-705× SKAU-MM-707	2.6	3.8	83.2	96.5	10.3	11.2	4.0	3.1	20.4	441.0	9.4	25.5	155.3	6.7	6.6	1.76	78.06
SKAU-MM-705× SKAU-MM-708	3.4	4.2	87.4	100.4	13.5	11.5	3.7	4.2	22.3	564.0	5.7	22.4	110.5	6.4	5.7	2.08	92.43
SKAU-MM-705× SKAU-MM-709	4.6	4.5	88.5	95.7	13.4	12.5	3.5	2.0	30.5	934.0	7.5	22.3	160.3	7.7	6.7	3.30	146.35
SKAU-MM-705× SKAU-MM-710	4.1	4.1	89.7	108.5	13.5	12.2	5.2	2.4	22.4	970.0	7.8	22.4	138.5	9.6	6.7	5.07	225.62
SKAU-MM-705× SKAU-MM-711	3.6	4.5	91.2	106.2	14.1	11.8	5.0	5.2	20.6	898.0	6.6	22.4	125.7	8.4	7.3	4.49	199.53
SKAU-MM-705× SKAU-MM-712	3.5	4.0	86.4	103.5	18.5	11.4	4.7	1.8	28.5	905.0	8.6	24.3	150.3	12.7	6.3	4.25	188.72
SKAU-MM-706× SKAU-MM-707	4.3	3.3	87.4	107.5	14.4	12.3	3.6	5.4	18.7	805.0	6.7	30.3	155.4	9.7	6.7	2.89	128.58
SKAU-MM-706× SKAU-MM-708	3.7	4.4	85.2	111.2	13.5	11.4	4.7	8.3	20.4	737.0	7.6	20.4	125.7	9.2	6.4	3.46	153.76
SKAU-MM-706× SKAU-MM-709	4.7	4.4	85.5	98.3	12.4	11.6	5.2	7.4	22.5	708.0	8.3	27.5	168.6	8.6	7.3	3.68	163.39
SKAU-MM-706× SKAU-MM-710	3.3	3.5	87.3	110.5	12.6	10.4	4.0	1.9	22.5	545.0	6.7	24.6	145.4	7.7	5.7	2.44	108.43
SKAU-MM-706× SKAU-MM-711	5.3	4.3	87.5	103.4	15.3	11.4	4.2	2.1	20.6	871.0	8.4	23.5	130.7	10.3	7.4	3.63	161.16
SKAU-MM-706× SKAU-MM-712	3.7	4.5	86.4	96.5	13.6	11.3	5.2	2.5	20.7	524.0	7.6	24.4	140.5	10.5	7.5	2.73	120.87
SKAU-MM-707× SKAU-MM-708	4.2	4.0	87.3	107.3	11.2	11.6	5.4	2.5	15.5	720.0	5.8	20.6	143.2	6.7	8.4	3.86	171.38
SKAU-MM-707× SKAU-MM-709	5.1	4.2	86.3	105.4	12.6	12.4	3.7	3.5	22.5	649.0	6.5	24.5	155.3	7.4	6.3	2.38	105.61
SKAU-MM-707× SKAU-	4.3	3.4	85.5	107.5	10.4	11.4	5.0	2.6	20.5	674.0	5.7	21.4	158.4	6.5	7.4	3.37	149.46

MM-710																	
SKAU-MM-707× SKAU-MM-711	4.4	3.5	90.3	104.2	9.4	9.7	3.7	2.0	18.6	497.0	6.6	21.3	130.7	5.5	5.6	1.84	81.47
SKAU-MM-707× SKAU-MM-712	5.4	4.4	84.8	110.5	12.9	11.5	4.5	2.7	25.5	524.0	8.3	28.4	175.3	8.4	6.3	2.35	104.58
SKAU-MM-708× SKAU-MM-709	5.5	3.5	88.2	102.4	12.5	12.6	4.0	3.5	22.5	654.0	6.7	18.7	105.7	7.7	6.7	2.61	116.13
SKAU-MM-708× SKAU-MM-710	4.7	3.5	87.5	97.2	13.9	12.4	4.7	2.6	35.4	908.0	5.7	15.4	90.7	7.4	4.4	4.26	189.46
SKAU-MM-708× SKAU-MM-711	5.0	4.2	86.4	91.6	11.3	10.4	4.5	1.8	25.4	538.0	6.8	19.4	120.4	6.3	4.7	2.42	107.24
SKAU-MM-708× SKAU-MM-712	4.2	4.3	85.4	96.3	12.5	10.6	3.6	2.7	30.4	604.0	5.4	17.7	115.6	8.6	5.4	2.19	97.32
SKAU-MM-709× SKAU-MM-710	5.3	3.4	87.5	107.5	12.3	12.6	5.0	5.4	30.5	1038.7	9.7	29.3	200.3	7.3	7.3	5.19	230.64
SKAU-MM-709× SKAU-MM-711	4.1	4.2	89.3	95.7	11.3	9.8	5.2	2.0	20.4	430.7	10.6	19.5	120.6	6.5	6.6	2.25	99.99
SKAU-MM-709× SKAU-MM-712	4.2	4.4	86.3	91.5	9.3	10.4	5.2	1.9	20.4	534.0	7.7	20.4	120.7	5.4	6.6	2.77	123.24
SKAU-MM-710× SKAU-MM-711	4.7	3.1	87.5	96.5	8.2	9.4	3.7	2.7	10.5	303.0	7.7	15.5	100.6	5.4	6.4	1.12	49.62
SKAU-MM-710× SKAU-MM-712	4.7	3.3	85.2	96.5	11.4	13.5	4.2	2.7	25.3	951.0	8.5	28.3	160.5	7.4	8.4	3.80	168.01
SKAU-MM-711× SKAU-MM-712	4.5	3.5	86.7	104.9	10.6	9.4	4.7	2.5	19.4	581.0	7.7	21.4	145.4	6.4	4.8	2.73	121.02
Mean	4.21	3.84	87.32	101.50	13.21	11.55	4.53	4.84	24.22	756.50	7.67	23.04	144.08	9.16	6.46	3.44	153.37
C.V	5.93	10.09	0.97	0.74	8.53	8.20	7.95	15.87	3.79	0.18	10.27	3.39	1.41	8.56	13.34	9.64	9.57
S.Em±	0.14	0.22	0.49	0.43	0.65	0.54	0.20	0.44	0.53	0.79	0.45	0.45	1.17	0.43	0.49	0.19	8.48
C.D at 5%	0.40	0.62	1.37	1.22	1.82	1.52	0.58	1.24	1.48	2.23	1.27	1.26	3.29	1.26	1.39	0.53	23.69

Average performance of muskmelon parents and their crosses also differ significantly for various quality traits and is presented in table 2. TSS is one of the important quality traits in muskmelon and the fruits with maximum TSS were more preferred by consumers. Here the maximum TSS (˚Brix) was found in parent SKAU-MM-706 (10.5) followed by SKAU-MM-704 (9.4) and in crosses SKAU-MM-701 × SKAU-MM-702 (12.2) followed by SKAU-MM-702 × SKAU-MM-706 (11.9). Vitamin C content mg/100gm was found to be maximum in SKAU-MM-701 (29.7) followed by SKAU-MM-703 (28.8) and in crosses SKAU- MM-701 × SKAU-MM-702 (33.4) followed by SKAU-MM-701 × SKAU-MM-712 (32.5). Maximum carotenoid content mg/100gm was observed in crosses SKAU-MM-701 (8.2) followed by SKAU-MM-2 (7.4) and in crosses SKAU-MM-701× SKAU-MM-702 (9.45) followed by SKAU-MM-701 × SKAU-MM-703 (8.6). Titrable acidity (% citric acid) was found to be maximum in parent SKAU-MM-708 (0.78) followed by SKAU-MM-706 (0.60) and in crosses by SKAU-MM-708 × SKAU-MM-712 (1.80) followed by SKAU-MM-708 × SKAU-MM-711 (1.0). Dry matter (%) was found to be maximum in parent SKAU-MM -706 (10.3) followed by SKAU-MM-703 (9.7) and in crosses by SKAU-MM-706 × SKAU-MM-707 (10.5) followed by SKAU-MM-703 × SKAU-MM-704 (9.8). Similar findings for various quality parameters have also been reported by Singh and Ram, 2003 [13]; Glala *et al.*, 2008 [15]; Rad *et al.*, 2010 [11]; Cheema *et al.*, 2011 [4] and Venkatesan *et al.*, 2017 [15].

Table 2: Mean performance of muskmelon (*Cucumis melo* L.) genotypes (parents and their crosses) for different quality traits

Crosses	TSS (˚Brix)	Vitamin C (mg/100 gm)	Carotenoid content (mg/100 gm)	Titrable acidity (% citric acid)	Dry matter content (%)
SKAU-MM-701	9.4	29.7	8.22	0.24	8.02
SKAU-MM-702	6.5	25.5	7.41	0.34	9.01
SKAU-MM-703	9.3	28.8	6.04	0.12	9.79
SKAU-MM-704	6.7	12.4	2.10	0.19	6.97
SKAU-MM-705	6.5	18.3	1.85	0.41	8.43
SKAU-MM-706	10.5	23.4	2.01	0.57	10.42
SKAU-MM-707	7.7	13.5	3.04	0.45	7.32
SKAU-MM-708	5.5	9.5	0.65	0.78	9.03
SKAU-MM-709	8.4	12.6	4.35	0.12	6.55
SKAU-MM-710	4.7	10.5	4.20	0.17	7.57
SKAU-MM-711	6.5	27.5	3.03	0.33	6.58
SKAU-MM-712	8.3	10.8	2.01	0.20	4.71
Crosses					
SKAU-MM-701 × SKAU-MM-702	12.2	33.4	9.45	0.34	8.21
SKAU-MM-701 × SKAU-MM-703	11.5	29.4	8.65	0.32	8
SKAU-MM-701 × SKAU-MM-704	7.6	30.2	7.35	0.28	7.82
SKAU-MM-701 × SKAU-MM-705	6.3	31.5	7.24	0.27	7.68
SKAU-MM-701 × SKAU-MM-706	8.4	28.6	7.15	0.36	7.35
SKAU-MM-701 × SKAU-MM-707	8.8	30.5	6.25	0.38	7.85
SKAU-MM-701 × SKAU-MM-708	6.5	28.2	6.10	0.30	7.72
SKAU-MM-701 × SKAU-MM-709	8.6	30.7	7.25	0.22	7.58
SKAU-MM-701 × SKAU-MM-710	6.3	31.3	8.05	0.26	7.38
SKAU-MM-701 × SKAU-MM-711	5.4	29.2	7.45	0.24	7.45
SKAU-MM-701 × SKAU-MM-712	7.5	32.5	7.35	0.35	8.1
SKAU-MM-702 × SKAU-MM-703	8.3	27.5	8.35	0.38	9.05
SKAU-MM-702 × SKAU-MM-704	7.4	24.4	7.22	0.40	9
SKAU-MM-702 × SKAU-MM-705	8.4	25.6	7.64	0.42	8.85
SKAU-MM-702 × SKAU-MM-706	11.9	26.3	6.46	0.32	8.95
SKAU-MM-702 × SKAU-MM-707	5.6	25.5	6.30	0.37	8.72
SKAU-MM-702 × SKAU-MM-708	5.4	26.7	5.45	0.35	8.78
SKAU-MM-702 × SKAU-MM-709	7.5	24.4	6.20	0.41	8.7
SKAU-MM-702 × SKAU-MM-710	5.6	23.8	6.10	0.44	8.68
SKAU-MM-702 × SKAU-MM-711	6.4	27.3	6.07	0.46	8.62
SKAU-MM-702 × SKAU-MM-712	5.4	26.7	6.35	0.48	8.29
SKAU-MM-703 × SKAU-MM-704	7.7	30.5	7.45	0.20	9.82
SKAU-MM-703 × SKAU-MM-705	8.4	29.6	7.26	0.24	9.78
SKAU-MM-703 × SKAU-MM-706	11.7	27.4	7.20	0.16	9.75
SKAU-MM-703 × SKAU-MM-707	8.6	28.6	6.65	0.18	9.7
SKAU-MM-703 × SKAU-MM-708	8.5	26.5	6.30	0.28	9.68
SKAU-MM-703 × SKAU-MM-709	7.6	29.7	6.15	0.30	9.64
SKAU-MM-703 × SKAU-MM-710	7.5	28.5	7.00	0.15	9.6
SKAU-MM-703 × SKAU-MM-711	7.4	27.4	7.10	0.19	9.58
SKAU-MM-703 × SKAU-MM-712	6.5	29.8	7.15	0.26	9.52
SKAU-MM-704 × SKAU-MM-705	7.4	16.6	3.55	0.25	7.02
SKAU-MM-704 × SKAU-MM-706	7.6	15.4	3.42	0.27	7.04
SKAU-MM-704 × SKAU-MM-707	4.4	14.6	3.15	0.30	6.89
SKAU-MM-704 × SKAU-MM-708	8.5	13.7	3.00	0.32	6.92
SKAU-MM-704 × SKAU-MM-709	7.6	12.5	2.35	0.34	9.79

SKAU-MM-704 × SKAU-MM-710	6.7	11.8	2.20	0.28	6.72
SKAU-MM-704 × SKAU-MM-711	7.3	12.2	2.25	0.23	6.7
SKAU-MM-704 × SKAU-MM-712	6.4	13.5	2.10	0.30	6.64
SKAU-MM-705 × SKAU-MM-706	6.4	20.5	2.32	0.52	8.48
SKAU-MM-705 × SKAU-MM-707	5.5	18.7	2.27	0.54	8.4
SKAU-MM-705 × SKAU-MM-708	5.3	19.5	2.25	0.58	8.38
SKAU-MM-705 × SKAU-MM-709	5.4	20.4	2.20	0.48	8.3
SKAU-MM-705 × SKAU-MM-710	10.4	17.6	2.10	0.44	8.28
SKAU-MM-705 × SKAU-MM-711	7.5	18.5	2.05	0.47	8.26
SKAU-MM-705 × SKAU-MM-712	11.5	20.3	1.97	0.56	7.84
SKAU-MM-706 × SKAU-MM-707	6.4	25	3.15	0.68	10.45
SKAU-MM-706 × SKAU-MM-708	9.6	26.8	3.10	0.72	9.72
SKAU-MM-706 × SKAU-MM-709	7.4	24.4	3.00	0.58	9.78
SKAU-MM-706 × SKAU-MM-710	7.5	25.8	2.85	0.54	9.82
SKAU-MM-706 × SKAU-MM-711	9.5	27.3	2.65	0.62	9.68
SKAU-MM-706 × SKAU-MM-712	8.3	25.8	2.35	0.64	9.5
SKAU-MM-707 × SKAU-MM-708	5.6	15.5	4.25	0.55	7.45
SKAU-MM-707 × SKAU-MM-709	5.3	16.8	4.15	0.52	7.42
SKAU-MM-707 × SKAU-MM-710	6.4	14.9	4.00	0.48	7.32
SKAU-MM-707 × SKAU-MM-711	4.7	17.5	3.96	0.47	7.3
SKAU-MM-707 × SKAU-MM-712	6.3	14.6	3.25	0.53	7.25
SKAU-MM-708 × SKAU-MM-709	8.3	12.2	1.00	0.82	9.05
SKAU-MM-708 × SKAU-MM-710	10.4	13.5	0.75	0.84	8.95
SKAU-MM-708 × SKAU-MM-711	6.5	11.9	0.55	1.01	8.8
SKAU-MM-708 × SKAU-MM-712	5.4	12.3	1.21	1.80	8.68
SKAU-MM-709× SKAU-MM-710	8.5	14.8	4.45	0.22	6.66
SKAU-MM-709× SKAU-MM-711	6.4	16.5	4.48	0.24	6.35
SKAU-MM-709× SKAU-MM-712	5.7	14.5	4.30	0.16	5.95
SKAU-MM-710× SKAU-MM-711	4.3	12.8	4.32	0.27	7.62
SKAU-MM-710× SKAU-MM-712	5.3	14.8	4.31	0.25	7.42
SKAU-MM-711× SKAU-MM-712	7.5	26.5	3.12	0.38	6.48
Mean	7.30	21.70	4.53	0.40	8.22
SD	1.76	6.93	2.28	0.24	1.19
CV	0.24	0.32	0.50	0.60	0.14

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