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REVIEW ARTICLE

Survey, Collection and Preliminary Observation of Culinary Melon Germplasm from Southern India

Ratnakar M Shet*[1], Shivanand Hongal[1], Shantappa T[2], Veeresha SM[1] and Jagadeesha RC[3]
[1]*College of Horticulture, Sirsi, University of Horticultural Sciences, Bagalkot, Karnataka-581401, India*
[2]*Regional Horticulture Research and Extension Centre, Dharwad, UHS, Bagalkot, Karnataka-580005, India*
[3]*College of Agriculture, Shivamogga, Keladi Shivappa Nayaka University of Agriculture and Horticultural Sciences (KSNUAHS), Shivamogga, Karnataka-577204, India*

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Culinary melon **(***Cucumis melo* spp. *agrestis* var. *acidulus***)** from southern India belongs to the family Cucurbitaceae and commonly known as 'Mangalore melon' or 'sambar cucumber' mainly used for culinary purpose. It is a common and popular vegetable found in almost every home in coastal districts of southern India. This crop has a special feature that the fruits can be stored up to 8-10 months without losing their freshness. Collection and conservation of the germplasm is first and foremost activity in the crop improvement programme. Sixty eight accessions of culinary melon were collected from farmer's fields and vegetable markets of southern Indian states namely Karnataka (31), Kerala (15), Telangana (1), Andhra Pradesh (16) and Tamil Nadu (5). The collected accessions had variability in fruit shape, fruit weight, fruit colour, flesh thickness, seed size, fruit yield, storage life, and other traits. Majority of the farmers cultivated the crop in small areas of paddy fallow land. Fruits may be stored for many weeks by hanging them from the roof ceiling, firmly bound by thin coconut fiber ropes/cut drip wire**.** The seeds of collected germplasm accessions are conserved at the College of Horticulture, Sirsi and will be further evaluated for their growth and yield parameters.

Key Words: Accessions, Collection, Culinary melon, Southern India, Germplasm, Survey

Introduction

Culinary melon **(***Cucumis melo* spp. *agrestis* var. *acidulus***)** is an important under-exploited vegetable of the family Cucurbitaceae and commonly known as 'Mangaluru melon','sambar cucumber', 'moggekayi' and so on. The fruit looks like a cucumber, has unique taste, flavor and aroma when cooked. Unlike the dessert melon, culinary melon is used in preparation of 'sambhar' (vegetable stew with lentils), 'dosa' (southern India rice bread), curries and 'chutneys' (Shruti *et al.,* 2016). It is an important vegetable in most of the homes of coastal districts of South India. It is an ideal summer vegetable crop in the fallow lands of paddy and also grown in *Kharif* mainly for fresh vegetable. South Indian culinary melon may be stored for 8-10 months without losing freshness. It produces small to large sized fruits with smooth tender skin, white flesh usually with high to medium acidity, little sweetness and odour (Swamy 2017). However, cultivation of culinary melon is restricted to few coastal districts of South India because of poor agronomic performance, blonde taste and less awareness about the crop to the rest of the world.

There is need for sustained effort to maintain and facilitate access to culinary melon / southern Indian melon germplasm. This is especially important for melon group and its wild relatives of the more diverse and less intensively cultivated culinary melon. With this background, survey and collection of culinary melon landraces / accessions from different Southern Indian states were collected and preliminary data were recorded.

Methodology

The survey and collection of culinary melon landraces/ accessions were initiated during April to August 2018 targeting five southern Indian states, namely, Karnataka, Kerala, Andhra Pradesh, Tamil Nadu and Telangana. Primary information of crop and growing region were collected from the State Agriculture and Horticulture Departments, ICAR-NBPGR Regional Stations, Krishi

**Author for Correspondence: Email- ratnakar.shet@uhsbagalkot.edu.in*

Vigyana Kendras, State Agricultural Universities and ICAR Institutes. Datasheet for collection of primary data was designed and used (Form 1). Random sampling technique was used for collecting accessions from growing regions of culinary melon. The areas of survey and collection are presented in Figure 1. The information collected from farmers was documented and 12 fruit component traits for 53 collected accessions namely shape, color, length (cm), breadth (cm), flesh thickness (cm), weight (kg) seed cavity length and width (cm), 100 seed-weight (g), seed per fruit, seed length and diameter (mm) were recorded in the laboratory to study the variability in the fruit collection. The mean and range were computed for comparing the traits among the collected accessions.

Results and Discussion

A total of 68 landraces of culinary melon, including two wild melons were collected from farmer's fields, vegetable markets of Kerala, Karnataka Andhra Pradesh and Tamil Nadu as well as from Kerala Agricultural University, Thrissur, Kerala and YSR Horticultural University, Venkataramagudem, Andhra Pradesh (Table1).

Survey and collection of germplasm

State-wise details are as follows:

Kerala

Surveyed 18 farmers' fields in the district of Thrissur, Mallapuram, Kannur, Wayanad, Kasaragod and Trivandrum. A total of 13 fruits were collected from Chevvoor, Vylantur, Pilicode, Adur, Kumbla, Ambalavayal, Edacheri, Muttippalam, Peravoor and Puttur (Kottikal), besides two seed samples from Kerala Agriculture University, Velanikkara, Thrissur. The fruits collected from Thrissur district are elongated and yellow incolor without prominent stripes. The fruits collected from Mallapurum district are small, round, yellow in color, called as 'Kanivellari'. In the hilly region (Wayanad) striped type fruits are predominantly found. The shelf -life of the fruit ranged from 3-6 months and mainly used for culinary purpose (Mr. Ashraf from Kannur, Personal communication). Farmers observations on shelf-life is supported by the study of Koli and Murthy (2013).

Karnataka

The traditional belt of culinary melon is Coastal and Malnad regions of Karnataka. During May (9-14) 2018 Sirsi, Yallapura, Siddapur, Kumta and Honnavartaluks of Uttar Kannada; Sagar, Hosnagara, Thirthalli, Soraba taluks of Shivammoga; Sringeri, Kadur taluks of Chickmagalore; Belthangadi, Ujire, Sulya, Mangalore

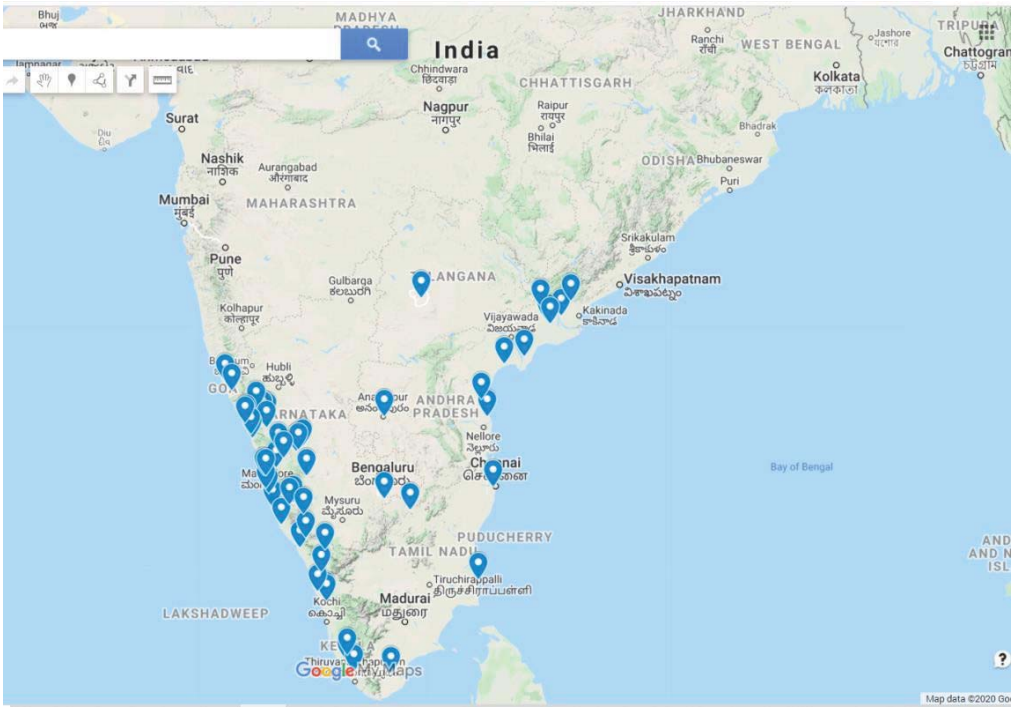

Fig. 1. Map showing survey and collection area of culinary melon landraces from southern India

Table 1. Landraces/ accessions of culinary melon/Mangalore melon collected from southern India (68)

Accession No	Botanical Name	Place of Collection	State	Latitude	Longitude	**Remarks**
MS1	*C. melo* var. *acidulus*	Chevvoor, Thrissur	Kerala	1 º46''N	76 º21''E	Fruits are ovate in shape, with green to yellow color rind, and white flesh
MS2	*C. melo* var *acidulus*	Chevvoor, Thrissur	Kerala	1 º46''N	76 º21''E	Elongated yellow colored fruit, Fully ripe fruit had good flavor
MS3	*C. melo* var *acidulus*	Vylantur Thrissur	Kerala	1 º61''N	76 ºº8''E	Elongated green to yellow colored fruits on maturity, looks like cucumber
MS4	*C. melo* var *acidulus*	Chevvoor, Thrissur	Kerala	9 º51''N	76 º76''E	Elongated green to yellow colored fruits on maturity, good juice content
MS5	*C. melo* spp. *agrestis*	Velanikkara, Thrissur	Kerala	1 º55'' N	76 º27'' E	Commonly known as senat seed, small gourd, and wild musk melon. Striped fruits, small to medium size>10 fruits/vine small seeded
MS6	*C. melo* spp. *agrestis*	Velanikkara, Trissur	Kerala	1 º55'' N	76 º27'' E	Commonly known as senat seed, small gourd, wild musk melon. Striped fruits, small to medium size >10 fruits/vine
MS-7	*C. melo* var. *acidulus*	Pilicode, Kasaragod	Kerala	12 º2 º''N	75 º11''E	Patchy striped, ovate shaped fruits
MS8	*C. melo* var. *acidulus*	Adur, Wayanad	Kerala	11 º59''N	76 º21''E	Ovate shape, green yellow stripe fruits with good flesh content
MS9	*C. melo* var. *acidulus*	Ambalavayal, Wayanad	Kerala	11 º63''N	76 º28''E	Oblate shape, green yellow stripe with medium fruit size
MS10	*C. melo* var. *acidulus*	Edacheri, Kozhikode	Kerala	11 º67''N	75 º61''E	Oblate shape, less prominent stripes, orange color on maturity
MS11	*C. melo* var. *acidulus*	Kozhikode	Kerala	11 º68''N	75 º61''E	Oblate shape, green with yellow stripes, matures at 55 days after sowing
MS12	*C. melo* var. *acidulus*	Kumbla, Kasaragod	Kerala	12 º5 º''N	74 º98''E	Ovate shaped, greenish yellow prominent stripes with average fruit weight of1.5-2 kg
MS13	*C. melo* var. *acidulus*	Peravoor, Kannur	Kerala	11 º89''N	75 º73''E	Oblate shaped, greenish yellow prominent stripes on maturity
MS14	*C. melo* var. *acidulus*	Puttur (Kottakal) Malappuram	Kerala	11 ºº2''N	76 ºº4''E	Round shaped, yellow color, small fruit
MS15	*C. melo* var. *acidulus*	Muttippalam, Mallapuram	Kerala	11 ºº4''N	76 ºº3''E	Round, golden yellow color, medium sized fruits, little sourish flesh
MS16	*C. melo* var. *acidulus*	Haleangadi, Mangaluru	Karnataka	13 ºº4''N	74 º79''E	Oblate, prominent green yellow stripes, medium sized fruits
MS17	*C. melo* var. *acidulus*	Kuluvelu, Mangaluru	Karnataka	13 ºº4''N	74 º8 º''E	Pyriform shaped, green yellow striped fruits
MS18	*C. melo* var. *acidulus*	Pavanji, Mangaluru	Karnataka	13 ºº2''N	74 º79''E	Seed samples were collected
MS19	*C. melo* var. *acidulus*	Olabailu, Udupi	Karnataka	12 º69''N	75 º6 º''E	Ovate, patchy green yellow striped fruit with good flesh content
MS20	*C. melo* var. *acidulus*	Konkarni, Udupi	Karnataka	12 º67''N	75 º6 º''E	Dark green color oblate shaped fruit with good flesh content
MS21	*C. melo* var. *acidulus*	Bapnalli, Sirsi	Karnataka	14 º68''N	74 º84''E	Green color, oblate fruit good crunchy flesh
MS22	*C. melo* var. *acidulus*	Manbhagi Sirsi	Karnataka	14 º74''N	74 º78''E	Oblate shape, green yellow striped fruit
MS23	*C. melo* var. *acidulus*	Manbhagi, Sirsi	Karnataka	14 º74''N	74 º78''E	White color, ovate, medium sized fruit
MS24	*C. melo* var. *acidulus*	Salkani, Sirsi	Karnataka	14 º66''N	74 º71''E	Oblong shaped, striped fruit
MS25	*C. melo* var. *acidulus*	Manchikere,Yellapur	Karnataka	14 º85''N	74 º82''E	Medium sized, ovate, green fruit
MS26	*C. melo* var. *acidulus*	Kadabala, Sirsi	Karnataka	14 º94''N	74 º81''E	White color, oblong fruit
MS27	*C. melo* var. *acidulus*	Kadabala, Sirsi	Karnataka	14 º94''N	74 º81''E	Light green, oblate shaped fruit
MS28	*C. melo* var. *acidulus*	Kadabala, Sirsi	Karnataka	14 º94''N	74 º81''E	Oblate shaped, green, prominent ribs on skin. Good flesh content
MS29	*C. melo* var. *acidulus*	Andur, Sirsi	Karnataka	14 º71''N	74 º9 º''E	Ovate, medium sized, green, yellow striped fruit
MS30	*C. melo* var. *acidulus*	Vajralli, Yellapur	Karnataka	14 º88''N	74 º57''E	>10 month shelf life, striped ,oblate fruit, young fruits bitter in taste
MS31	*C. melo* var. *acidulus*	Karingolli, Hosnagar Shimoga	Karnataka	13 º91''N	75 ºº6''E	Oblate shape, patchy green with yellow stripes
MS32	*C. melo* var. *acidulus*	Karingolli, Hosnagar Shimoga	Karnataka	13 º91''N	75 ºº6''E	Oblate shape, patchy green with yellow stripes with good flesh content

Accession No	Botanical Name	Place of Collection	State	Latitude	Longitude	**Remarks**
MS33	*C. melo* var. *acidulus*	Shantaveri, Thirthahalli, Shimoga	Karnataka	13 º75''N	75 º19''E	Oblate shape, patchy green with yellow stripes, medium sized fruit
MS34	*C. melo* var. *acidulus*	Araga, Thirthahalli, Shimoga	Karnataka	13 º73''N	75 º2 º''E	Oblate shape, patchy green with yellow stripes
MS35	*C. melo* var. *acidulus*	Baarkodi, Sringeri, Chickmagalore	Karnataka	13 º41''N	75 º18''E	Oblate shape, patchy green with yellow stripes
MS36	*C. melo* var. *acidulus*	Kimnajji, Belthangadi, Dakshina Kannada	Karnataka	12 º92''N	75 3 º''E	Oblate shape, orange color fruits on maturity, early type
MS37	*C. melo* var. *acidulus*	Koyyur, Belthangadi, Dakshina Kannada	Karnataka	12 º9 º''N	75 3 º''E	Elliptical, patchy green with yellow stripes on maturity
MS38	*C. melo* var. *acidulus*	Bellare, Sulya, Dakshina Kannada	Karnataka	12 º66''N	75 º36''E	Oblate, green yellow striped fruit
MS39	*C. melo* var. *acidulus*	Medanaadu, Kodagu	Karnataka	12 º41''N	75 º66''E	Oblate shaped, green with scattered yellow patches
MS41	*C. melo* var. *acidulus*	Hosakoppa, Sidhapur, Uttara Kannada	Karnataka	14 º73''N	74 º98''E	Oblate medium sized orange color on maturity fruits
MS42	*C. melo* var. *acidulus*	Harsikatta, Sidhapur, Uttara Kannada	Karnataka	14 º72''N	74 º98''E	Green color oblate shaped big size fruits with good flesh content
MS43	*C. melo* var. *acidulus*	Gokarna, Kumta, Uttara Kannada	Karnataka	14 º7 º''N	74 º32''E	Elongated green yellow Scattered stripes
MS44	*C. melo* var. *acidulus*	Hegde, Kumta, Uttara Kannada	Karnataka	14 º55''N	74 º31''E	Oblate shaped, patchy green with yellow stripes on maturity
MS45	*C. melo* var. *acidulus*	Honnavar, Uttara Kannada	Karnataka	14 º23''N	74 º5 º''E	Oblate yellow color with less prominent stripes fruits
MS46	*C. melo* var. *acidulus*	Honnavar, Uttara Kannada	Karnataka	14 º27''N	74 º44''E	Pyriform, green with yellow stripes on maturity
MS48	*C. melo* var. *acidulus*	Medipetnum, Hyderabad	Telangana	13 º24''N	77 º7 º''E	Round, orange color small size fruit
MS49	*C. melo* var. *acidulus*	Avupadu, West Godavari	Andhra Pradesh	16 º81''N	81 º53''E	Round, orange color small fruit
MS50	*C. melo* var. *acidulus*	Avupadu West Godavari	Andhra Pradesh	17 º41''N	81 º28''E	Seed samples collected
MS51	*C. melo* var. *acidulus*	Prakasaraopalem, West Godavari	Andhra Pradesh	16 º94''N	81 º4 º''E	Seed samples collected
MS52	*C. melo* var. *acidulus*	Venkataramagudem, West Godavari	Andhra Pradesh	17 º31''N	81 º18''E	Round, golden yellow color
MS53	*C. melo* var. *acidulus*	Nerakoduru, Guntur,	Andhra Pradesh	15 º91''N	8 º47''E	Seed samples collected
MS54	*C. melo* var. *acidulus*	Nerakoduru, Guntur,	Andhra Pradesh	15 º91''N	8 º47''E	Seed samples collected
MS56	*C. melo* var. *acidulus*	Rajendra Nagar, Hyderabad	Andhra Pradesh	17 º32''N	78 º4 º''E	Seed samples collected
MS57	*C. melo* var. *acidulus*	Rajendra Nagar, Hyderabad	Andhra Pradesh	17 º32''N	78 º4 º''E	Round, orange color small fruit
MS59	*C. melo* var. *acidulus*	Nagupalli, Khammam	Andhra Pradesh	17 º66''N	82 º99''E	Seed samples collected
MS60	*C. melo* var. *acidulus*	Aswaraopet, Khanmam	Andhra Pradesh	17 º24''N	81 º33''E	Seed samples collected
MS63	*C. melo* var. *acidulus*	Venkataramagudem, West Godavari	Andhra Pradesh	17 º31''N	81 º18''E	Seed samples collected
MS64	*C. melo* var. *acidulus*	Podalakur, Nellur	Andhra Pradesh	14 º38''N	79o 73''E	Seed samples collected
MS65	*C. melo* var. *acidulus*	Naredumilli, East Godhavari	Andhra Pradesh	17 º16''N	82 ºº6''E	Seed samples collected
MS66	*C. melo* var. *acidulus*	Darsi, Prakasam	Andhra Pradesh	15 º77''N	79 º68''E	Seed samples collected
MS68	*C. melo* var. *acidulus*	Mirzapuram, Krishna	Andhra Pradesh	16 º94''N	81 º4 º''E	Round yellow color fruit with little sour taste flesh
MS69	*C. melo* var. *acidulus*	Prakasaraopalem, West Godavari	Andhra Pradesh	16 º9 º''N	81 º42''E	Seed samples collected
MS70	*C. melo* var. *acidulus*	Avapadu, West Godavari	Andhra Pradesh	13 ºº7''N	8 º2 º''E	Seed samples collected
MS71	*C. melo* var. *acidulus*	Chennai, Market	Tamil Nadu	8 º71''N	77 º75''E	Round orange color small fruit
MS72	*C. melo* var. *acidulus*	Tirunelvelli	Tamil Nadu	11 º94''N	79 º81''E	Globular shaped yellow color small fruit
MS73	*C. melo* var. *acidulus*	Kariakal	Tamil Nadu	15 º91''N	8 º47''E	Oblate golden yellow color fruit
MS74	*C. melo* var. *acidulus*	Krishnagiri	Tamil Nadu	12 º51''N	78 º22''E	Elliptical Stripe fruit, Medium size fruit
MS75	*C. melo* var. *acidulus*	Krishnagiri	Tamil Nadu	12 º51''N	78 º22''E	Pyriform shaped striped fruit
MS79	*C. melo var. acidulus*	Salkani, Sirsi	Karnataka	14 º66''N	74 º71''E	Seed samples collected

taluks of Dakshina Kannada; Bramhavartaluk of Udupi; and Madikeri taluk of Kodagu were surveyed. A total of 30 fruits were collected during survey. The fruits from coastal Karnataka were ovate to oblate in shape and patchy green color rind with white prominent stripe. However, green color fruits were observed in Malnad regions especially Sirsi, Siddhapur and Yellapur taluks of Uttara Kannada. Most of the farmers of Uttara Kannada grow the culinary melon organically and able to store fruits from *Kharif* to next summer season. Fruits can be stored for many weeks by hanging them from the ceiling, firmly bound by thin banana fiber ropes/cut drip wire (Dattatreya Hegde-personal communication).

Andhra Pradesh/Telangana

Telangana and Andhra Pradesh areas were surveyed during April 27-29, 2018 and seed samples of 13 accessions were collected from YSR Horticulture University as well as from vegetable growers and four fruit selfless from Budhuvelle (Medipetnum market), Hyderabad, Venkataramdugem, Bapatla, West Godavari districts of Andhra Pradesh. The fruits are small, round in shape with scattered patches on skin and turns yellow color on maturity.

Tamil Nadu

Accessions from Tamil Nadu are similar to Kerala types and cultivated in limited area (Dr. John Joseph-personnel communication). Hossur, Krishnagiri, Dharmapuri, Salem, Dindugul, Palakad (Kerala State), Tirunelveli, Chennai market and Coimbatore districts of Tamil Nadu were surveyed during July 10-14, 2018 and five fruits collected.

According to the information collected from scientists of Tamil Nadu Agricultural University, Coimbatore and Centre of Excellence for Vegetables at Reddiarchatram, Tamil Nadu crop cultivation area is decreasing in Tamil Nadu and grown in some parts of Tirunelveli and Madurai regions. Farmers are mainly growing pumpkin for culinary purpose rather than culinary melon in northern parts of Tamil Nadu. However, during British rule in India culinary melon (Madras cucumber) was introduced to India's east coast (Madras province) in 1805. Madras province as defined under British law, which extended to present-day Tamil Nadu, Andhra Pradesh, parts of Karnataka and Kerala (Vidya, 2012). Madras was the main shipping centre for Kerala and Tamil Nadu. Fruit produced in Kerala was shipped through Madras as a result, 'Vellari' crop in Kerala is also known by Tamilians as 'Madras cucumber' (personnel communication)

Variability collected

Out of 68 accessions collected from the five Southern Indian states, 51 fruit samples were subjected for post-harvest observations on 12 fruit component traits to understand the extent of variability in the collection. Data is presented in Table 2 and variability of fruit size, shape and color is presented in Figure 2. The analysis of data revealed that significant variation exists among the collected accessions for fruit traits. The accessions had bigger size fruits and weight ranged from 220-3,900 g with mean of 1559 g. The accessions collected from Kadabala Sirsi (MS-26, MS-27, MS-28) had maximum fruit weight. The application of organic fertilizer (panchamrutha) at flowering stage and sufficient irrigation increases fruit size as informed by Kadabala farmer Mr. SN Bhat. The fruits length and breadth are associated with flesh thickness, seed cavity length and width. Fruits component variability was higher in Karnataka accessions namely MS-21, MS-22, MS-26, MS-27, MS-28, MS-30 and MS-79 compared to accessions from other states.

The flesh thickness of collected accessions ranged from 1.1 to 5.5 cm with a mean of 3.27 cm. The Karnataka state collected accessions viz., MS-21 had maximum flesh thickness (5.50 cm) followed by MS-30 (5.25 cm) and MS-28 (5.00 cm) which is important component for culinary purpose. The maximum length of the fruit (35.50 cm) was observed in accession MS-2 collected from Thrissur district of Kerala. High variability was observed for seed characters namely seed length, seed diameter, seed number and 100-seed weight. The seed length varied from 6.92 to 9.97 mm with mean of 8.64 mm similarly seed diameter (1.94-4.15 mm), seeds/fruit (180-604) and 100-seed weight (1.66–3.68g). The seeds of *agrestis* and Andhra Pradesh collections are small (less than 6 mm seed length) compared to others. Dhillon *et al.* (2012), Fergany *et al.* (2011), Manohar and Murthy (2012) also reported < 9 mm seed length in collected culinary melon landraces.

The collected fruits had wide variability in shape and color. Among the 51 collected accessions, fruit shape varied from ovate (18), oblate (17), elongated (4), elliptical (6) and round (6). The maximum number of ovate and oblong fruits were collected from Karnataka had higher flesh thickness compared to elongated,

Table 2. Variability in mean values of fruit components among the south Indian collected accessions

Accessions No	Fruit length (cm)	Fruit breadth (cm)	Fruit weight (g)	Flesh thickness (cm)	Seed cavity length (cm)	Seed cavity width (cm)	Seeds/ fruits	Seed length (mm)	Seed diameter (mm)	100 seed weight (g)
MS 1	35.50	8.25	1430	2.75	29.00	1.75	400.00	9.17	3.42	2.90
MS 2	23.00	7.75	680	1.70	17.00	4.00	482.00	7.90	3.01	1.90
MS 3	17.00	7.50	500	1.80	11.50	4.00	300.00	7.80	3.12	2.10
MS 4	32.50	13.00	2850	4.00	27.40	5.30	525.00	8.20	3.10	1.75
MS 7	16.70	11.00	1100	2.50	14.00	7.50	324.00	7.80	3.60	2.10
MS 8	10.00	7.00	220	1.10	7.50	4.00	258.00	8.90	2.01	1.68
MS 9	26.50	11.50	1800	4.50	14.00	4.00	400.00	8.62	3.40	2.25
MS 10	24.00	13.50	2300	3.50	19.00	4.50	286.00	7.92	3.60	2.10
MS 11	19.00	11.50	2300	3.50	15.00	5.50	352.00	8.25	3.58	2.60
MS 12	22.00	13.00	1700	3.20	15.50	5.00	305.00	9.20	2.44	2.80
MS 13	19.00	10.50	1300	3.50	14.50	4.50	238.00	8.50	3.20	1.95
MS 14	9.20	9.00	490	1.70	7.00	4.50	321.00	6.92	3.50	1.68
MS 15	10.20	10.50	520	2.50	7.50	6.00	352.00	7.00	3.12	1.86
MS 16	11.50	8.00	260	2.00	9.50	4.00	278.00	9.37	4.08	2.59
MS 17	13.00	8.00	490	2.30	8.50	3.50	180.00	9.83	4.15	2.55
MS 19	17.50	10.50	820	3.00	10.00	4.50	255.00	8.72	3.99	2.71
MS 20	24.00	15.00	2100	4.30	14.00	6.50	515.00	8.72	3.30	1.95
MS 21	28.00	15.50	3450	5.50	21.50	5.60	289.00	8.32	2.80	2.20
MS 22	19.30	12.50	3850	3.50	12.50	5.50	272.00	8.81	3.80	1.89
MS 23	21.00	16.00	2270	4.75	16.00	5.00	375.00	8.71	3.40	1.80
MS 26	29.00	18.00	3900	4.65	13.00	4.00	295.00	9.66	3.92	3.36
MS 27	26.00	17.50	3750	4.70	19.50	6.00	604.00	9.19	3.98	3.15
MS 28	27.00	18.50	3900	5.00	20.50	7.00	598.00	8.95	4.04	2.96
MS 29	18.50	14.00	1650	3.60	11.00	6.50	565.00	8.10	2.45	2.38
MS 30	17.00	14.00	1550	5.25	12.00	5.50	300.00	9.03	3.77	2.97
MS 31	22.00	16.00	2400	4.50	12.00	5.00	445.00	9.33	3.88	3.68
MS 32	23.50	11.80	1900	4.25	12.00	4.50	483.00	8.84	3.55	1.98
MS 33	23.00	12.00	1400	3.50	18.00	5.00	498.00	9.55	3.94	2.85
MS 34	23.00	10.30	1410	3.10	16.00	4.30	483.00	9.33	3.88	3.68
MS 35	26.30	12.60	2150	3.50	17.00	5.80	398.00	8.84	3.55	1.98
MS 36	24.00	10.50	1150	3.00	16.00	4.50	520.00	9.55	3.94	2.85
MS 37	22.50	11.50	1500	2.50	13.00	7.00	361.00	9.97	3.29	2.79
MS 38	23.00	11.20	1600	3.50	15.00	5.00	258.00	7.89	1.94	2.37
MS 39	21.00	11.80	1300	3.20	13.50	5.20	380.00	9.90	3.97	3.06
MS 40	22.00	11.20	1300	2.50	16.00	6.00	353.00	9.51	4.03	2.85
MS 41	24.50	12.50	1900	3.50	17.50	5.50	238.00	9.23	3.33	2.84
MS 42	23.50	12.00	1500	4.00	15.50	4.50	511.00	9.46	3.80	2.89
MS 43	27.50	13.00	2150	3.80	17.00	5.00	500.00	7.17	2.95	1.66
MS 44	26.50	11.80	1900	3.70	19.50	5.50	307.00	8.56	3.50	2.31
MS 45	19.50	12.50	1500	3.50	13.00	4.70	494.00	8.53	3.39	2.16
MS 46	15.00	13.00	1250	3.50	11.00	5.20	232.00	8.55	3.53	2.21
MS 47	15.00	10.00	750	2.70	10.50	4.50	319.00	8.35	3.62	3.50
MS 57	16.50	10.70	800	3.50	10.50	4.00	300.00	9.80	3.86	2.80
MS 65	12.50	7.30	330	1.50	9.00	4.50	542.00	6.93	3.37	2.63
MS 68	16.70	10.00	850	3.00	11.00	5.50	421.00	7.93	3.90	1.76
MS 71	11.00	9.50	700	2.50	8.00	5.50	321.00	7.81	3.73	1.77
MS 72	19.00	10.00	900	3.10	15.50	4.00	465.00	7.32	3.77	2.17
MS 73	16.00	9.50	750	2.20	11.50	4.70	382.00	9.64	4.12	2.66
MS 74	14.50	11.00	800	3.00	10.50	4.50	347.00	9.30	3.80	2.23
MS 75	17.00	8.00	700	2.00	13.00	5.00	320.00	7.20	2.70	2.10
MS 79	20.00	10.50	1400	3.00	12.50	5.50	412.00	8.61	3.82	2.99
Mean	20.42	11.60	1558.55	3.27	14.32	4.99	379.58	8.64	3.49	2.45
Minimum	9.20	7.00	220.00	1.10	7.00	1.75	180.00	6.92	1.94	1.66
Maximum	35.50	18.50	3900.00	5.50	29.00	7.50	604.00	9.97	4.15	3.68

Fig. 2. Culinary melon variability collected from southern Indian states

FORM1

Data Sheet for collection of Primary Data/Information on Mangalore Southekayi Landraces/ Local Varieties

1. Name of Collecting Institute :
2. Date of Collecting:
3. Collecting Number:
4. Name & Address of Farmer:
5. Age of farmer:
6. Educational level: Illiterate/Read only/Read & write/Primary school/Middleschool/High school/PUC/Diploma/Degree/PG
7. Status of Sample: Traditional cultivar/Landrace/Variety
8. Local/Vernacular Name(s) :
9. Type of sample collected: Fruits/Seeds
10. Extent of Areas (in ha or Number of plants):
11. Growing condition :Wetland/Dryland
12. Grown as: Monocrop/Intercrop
    If intercrop, specify the crops:
13. Cultural practices adopted by the farmer:
14. Fruit shape:
15: Fruit weight:
16. Skin/Rind colour/pattern:
17. Number of fruits per vine :
18. Days to fruit harvest :
19. Other crops grown:
20. Driving force to take up this crop:
21. USP (Unique selling preposition) of this crop such as taste, shape, colour :
22. Additional Notes :
    Parts used-Culinary uses-Shelf life-Storage method-Source of seeds-Reaction to pest and diseases-Marketing-Income-
    Is it a profitable crop as mono crop or supports the livelihood?

elliptical and round shape fruits. Similarly, fruit color ranged from dark green to white, yellow to golden yellow to orange, green and white to yellow stripes. The green color fruits didn't change its color and had longer shelf life (>8 months) compared to other fruit types. All types of fruits showed more than six month shelf-life, indicating promising genetic source for enhancing the shelf-life of other melon group vegetables (Manohar and Murthy, 2012). The preliminary observations revealed that the accessions collected from Karnataka namely MS 21, MS 27, MS 28, MS 30, MS 34, MS 36, MS 38, MS 39, MS 42 were oblate shaped and medium to bigger sized fruits with higher shelf-life. These accessions had detailed evaluation along with collected germplasm of culinary melon from southern India in augmented design.

Conclusion

Collection, conservation and utilization of desirable germplasm in crop improvement program is a continuous process. The survey and collection generate precious genetic resources of culinary melon from southern India which can be utilized for genetic improvement of culinary melon as well as other melon group vegetables for various biotic and a biotic resistance breeding. Evaluation of collected germplasm will open various ways for future research programs. The shelf-life of culinary melon can be exploited through introgression breeding for enhancing storage life of musk melon and other melon group of vegetables in near future.

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