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Short Communication

Morphological characterization and genetic barcoding of kuttiatoor mango accessions

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ABSRACT

A survey conducted during 2013-14 to collect and characterize the Kuttiattoor mango accessions from Kerala, revealed large unique variability in morphological, biochemical and DNA barcode data. All the accessions were polyembryonic with fruit maturity during February-March. The mature fruit length (cm), width (cm) and leaf length (cm) ranged from 5.10 – 9.60 (cm), 4.60 – 8.40 (cm) and 12.47- 30.40 (cm) respectively.

Key words: Polyembryony, DNA barcode, mango, characterization

INTRODUCTION

Mango (*Mangifera indica* L.*)* originated from the Indo-Burma region and the genus *Mangifera* has more than 60 species world-wide, the highest diversity being found in the Malayan Peninsula, Borneo and Sumatra (Bompard,1993). Mango has enormous variability at the levels of wild types and cultivars in India. The updated list now contains the names of 1682 cultivars (Pandey and Dinesh, 2010). Among the seven centres of mango variability including wild and seedling types of *M. indica* L. in India, humid tropical southern peninsular India is an important one (Yadav, & Rajan, 1993). A survey was carried out in this region at Kuttiattoor, Thaliparamba Tehsil, Kannur District, Kerala, during 2013-14 to collect, characterize and document the unique mango grown by the farmers of this village. During the survey, 10 unique mango accessions were selected randomly based morphological and fruit characters which were recorded as per the Bioversity International descriptors (1989, Table1). Large variability was observed to exist among the accessions for 9 leaf characters and 19 fruit characters. The fruits were medium fibrous, juicy and having thin peel. The mature fruit length (cm), width (cm) and leaf length (cm) ranged from 5.10 – 9.60 (cm), 4.60 – 8.40 (cm) and 12.47- 30.40 (cm) respectively (Table 1). All the Kuttiatoor accessions were polyembryonic as it is common in mango varieties derived from Southeast Asian ancestry (Iyer, 1991), which bear fruits more heavily and more consistently than monoembryonic varieties.

DNA barcoding is considered to be a useful tool for identification of plant species and also to study the evolutionary relationship among the species within the genera. The DNA barcodes of 10 accessions (fig 1) were different from one another as reported by Li *et al.*, (2015). Kuttiattoor mango accessions were thus unique with early harvesting and qualify for registration with the Protection of Plant Varieties & Farmers' Rights Authority.

Table 1. Minimum descriptors of Kuttiattoor mango accessions

Farmer name	**Surendra**	**Karthyayani (Plant-1)**	**Gopalan (Plant -2)**	**Gopalan (Plant -1)**	**Kuttiattoor school AUP (Plant 1)**	**Prabhakaran**	**Deepak rishal**	**Abdula kaya Sample -1**	**IRRITI check post**	**Kuttiattoor Karthayani (Plant -2)**
Characteristics	Kuttiattoor-2	kuttiattoor-3	kuttiattoor-4	Kuttiattoor-5	kuttiattoor-7	Kuttiattoor-8	kuttiattoor-9	Kuttiattoor-10	Kuttiattoor-11	Kuttiattoor-12
Young leaf: intensity of anthocyanin coloration (before full expansion of oldest leaf of the new flush):1 Absent	1	1	1	1	1	1	1	1	1	1
Leaf blade: length (cm)	19.20	19.27	12.47	16.70	12.97	15.47	12.90	14.17	30.40	16.27
Leaf blade: width (cm)	5.87	7.67	4.17	5.47	3.23	4.43	4.10	5.20	8.97	5.60
Leaf blade: ratio length/width: 3 Small & 5 Medium	5	3	5	5	5	5	5	5	5	3
Leaf blade: shape: 3 Ovate & 7 Oblong	7	3	7	3	3	3	7	7	7	3
Leaf blade: colour1 Light green, 2 Medium green, 3 Dark green	3	2	1	2	2	2	2	2	2	1
Leaf blade: twisting: 1Absent	1	1	1	1	1	1	1	1	1	1
Leaf blade: shape of base: 2 Obtuse and 3 Rounded	3	2	2	2	2	2	3	3	3	2
Leaf blade: shape of apex: 3 Acute	3	3	2	3	3	3	3	3	3	3
Petiole: length (cm)	3.5	2.17	1.67	2.30	3.73	3.00	1.63	1.27	5.50	3.37
Mature fruit characteristics										
Length (cm)	9.4	8.10	7.40	8.00	6.00	5.10	8.50	9.60	6.10	8.30
Width (cm)	8.4	7.30	6.80	6.60	5.30	4.60	7.70	8.00	5.50	7.00
Colour of skin: 2 Only green & 3 Green and yellow	2	3	3	2	2	2	2	3	3	2
Density of lenticels: 3 Sparse, 5 Medium, 7 Dense	5	5	5	7	3	7	5	5	7	3
Colour contrast between lenticels and skin: 5 Medium, 7 Strong	5	5	5	7	5	7	5	5	7	5
Size of lenticels: 5 Medium	5	5	5	5	5	5	5	5	5	5
Roughness of surface (corkiness) caused by lenticels: 1 Absent, 9 Present	9	9	9	9	1	9	1	1	9	9
Presence of cavity at stalk:1 Absent , 9 Present	9	9	9	9	9	9	9	9	9	9
Depth of cavity at stalk:1 Shallow	1	1	1	1	1	1	1	1	1	1
Presence of neck:1 Absent, 9 Present	1	1	1	1	1	9	9	1	1	1

Shape of ventral shoulder: 1 Rounded upward	1	1	1	1	1	1	1	1	1	1
Shape of dorsal shoulder: 1 Rounded upward	1	1	1	1	1	1	1	1	1	1
Presence of groove in ventral shoulder: 1 Absent	1	1	1	1	1	1	1	1	1	1
Bulging on ventral shoulder: 1 Absent	1	1	1	1	1	1	1	1	1	1
Presence of sinus: 9 Present	9	9	9	9	9	9	9	9	9	9
Depth of sinus: (3 Shallow)	3	3	3	3	3	3	3	3	3	3
Bulging proximal of stylar scar: 1 Absent	1	1	1	1	1	1	1	1	1	1
Point at stylar scar: 1 Absent	3	3	3	3	3	3	3	3	3	3
Time of fruit maturity: 1 Very early	1	1	1	1	1	1	1	1	1	1

(*As per the DUS Guidelines on Mango, PPV & FRA, 2008)

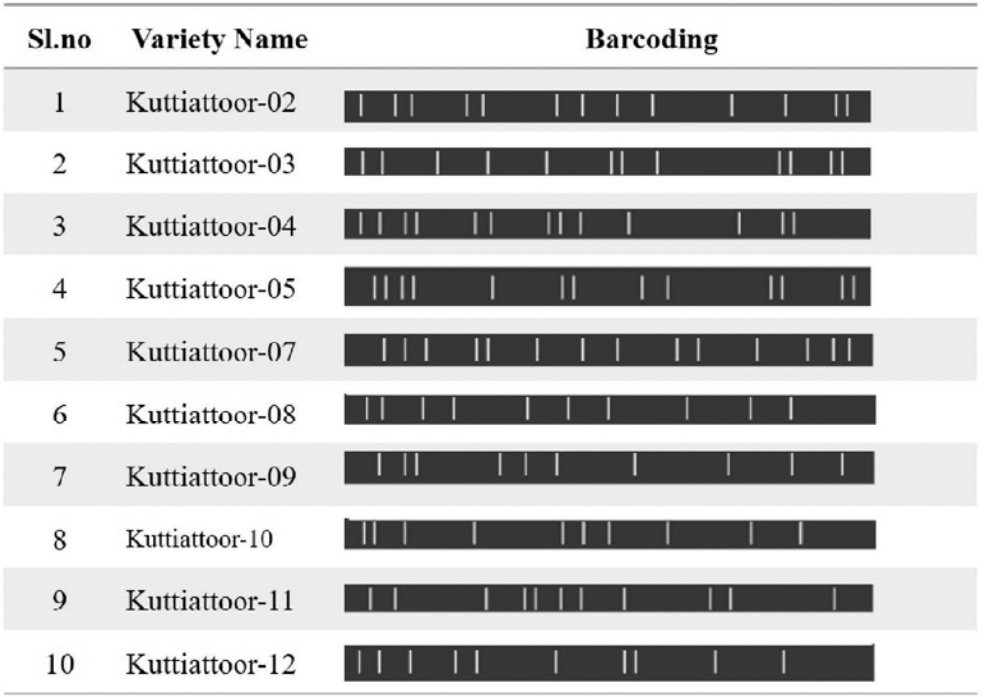

Fig.1. DNA barcodes of kuttiattoor mango accessions

REFERENCES

Bompard, J. M. (1993). The genus Mangifera rediscovered: the potential contribution of wild species to mango cultivation. *Acta Horti*.**341**, 69-77.

Iyer, C.P.A. (1991). Recent advances in varietal improvement in mango. Acta Hort. **291**, 109–32.

Li, X., Yang Yang, Robert J. Henry, Maurizio Rossetto, Yitao Wang and Shilin Chen.2015. Plant DNA barcoding: from gene to genome. Biol. Rev. **90**: 157–166.pp doi: 10.1111/brv.12104

Pandey, S.N., & and Dinesh, M.R. (2010). Mango, Indian Council of Agricultural Research, New Delhi, pp. 30-97.

PPV & FRA (2008).Guidelines for conduct of test for DUS Mango (*Mangifera indica* L.), Protection of Plant Varieties and Farmers Right Authority, GOI, NASC Complex, DPS Marg, New Delhi-110012, p.17

Yadav, I. S., & and Rajan, S. (1993). Genetic Resources of Mango. Advances in Horticulture, Vol. 1. Fruit, part1, (Eds) K.L. Chadha and O.P. Pareek, eds. Malhotra Publishing House, New Delhi, p.77-93.

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