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Evaluation of different curry leaf genotypes for number and length of primary, secondary and tertiary branches

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Abstract

The study titled "Evaluation of Different Curry Leaf (*Murraya koenigii*) Genotypes" was carried out at the Department of Plantation, Spice, Medicinal and Aromatic Crops, College of Horticulture, Dapoli, Ratnagiri, during 2024-2025 under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Fifteen mature curry leaf accessions (*Murraya koenigii*), ranging in age from 10 to 15 years, were used for an assessment documented in the study "Evaluation of Different Curry Leaf Genotypes." These plants were strategically chosen based on their yield potential, aromatic quality and overall vigour.

Keywords: Genotype evaluation, curry leaf, *Murraya koenigii*, number of branches, length of branches

1. Introduction

The curry leaf (*Murraya koenigii*) plant is classified within the Rutaceae family and the *Murraya* genus. Genetically, it is a true diploid, characterized by a chromosome count of $2n=18$ (with a base number of $x=9$). This species is native to, and thrives across, various tropical and subtropical locales globally. Morphologically, it presents as an aromatic, semi-deciduous and unarmed small tree or shrub, typically reaching heights up to six meters and featuring a woody stem that is sturdy yet slender. The entire plant is useful, with the leaves, root, bark and fruits all being utilized. The leaves, known for their slightly pungent, bitter and feebly acidic taste, maintain their flavor and quality even when dried. They are commonly used, both fresh and as dried leaf powder or essential oil, to flavor a wide range of food preparations, including soups, curries and traditional curry powder blends (Verma, 2018) ^[7]. The stem of the curry leaf plant (*Murraya koenigii*) exhibits a colour spectrum from brown to a dark green and its bark is marked with small, node-like dots. Removing the bark longitudinally reveals the white wood beneath. This main trunk is capable of reaching heights up to 6 meters and typically has a girth of about 16 cm. Its diameter is often reported to be between 15 and 40 cm (Jain *et al.*, 2017) ^[12]. Historically, the raw green leaves of *Murraya koenigii* have been consumed to treat acute gastrointestinal issues such as diarrhoea and dysentery and they are also used to suppress vomiting. Beyond this, both the leaves and roots are traditionally employed as bitter tonics, as an anti-parasitic agent and for analgesic (pain-relieving) purposes. Curry leaf also helps in managing piles, inflammation and itching, as well as being beneficial for leukoderma and certain blood disorders (Reddy *et al.*, 2018) ^[5]. The major constituent responsible for the aroma and flavor has been reported as pinene, sabinene, caryophyllene, cadinol and cadinene (Singh *et al.*, 2014) ^[6].

2. Materials and Methods

A research project, "Evaluation of different curry leaf (*Murraya koenigii* L.) genotypes," was executed from 2024 to 2025. It took place at the Department of Plantation, Spice, Medicinal and Aromatic Crops, College of Horticulture, Dapoli, Ratnagiri, under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. The initial phase involved a survey to identify superior curry leaf accessions. Based on assessments of plant health, vigour and leaf aroma, a final collection of 15 distinct curry leaf types was ultimately chosen for detailed evaluation in the study.

2.1 Number of primary, secondary and tertiary branches

Number of primary, secondary and tertiary branches were counted in each accession and numbers were recorded.

2.2 Length of primary, secondary and tertiary branches

The length of primary, secondary and tertiary branches was measured with measuring tape and was expressed in metres and the average was recorded by dividing length of branches and number of branches.

3. Results and Discussion

3.1 Number of primary branches

The number of primary branches is a critical determinant of a curry leaf tree's canopy structure and overall habit, directly influencing the subsequent development of secondary and tertiary branches. Across the studied curry leaf accessions, the primary branch count varied significantly, ranging from 2 to 6. The highest number of primary branches (6) was observed in accessions CL-9 and CL-14, closely followed by CL-2 with five branches. A group of six accessions—CL-4, CL-6, CL-7, CL-8, CL-11 and CL-12—displayed the minimum recorded value of 2 primary branches. Accessions CL-1, CL-3, CL-5, CL-10, CL-13 and CL-15 all showed an intermediate count of three primary branches.

These findings align partly with prior research; for instance, Peter (2019) ^[3] reported a primary branch range of 2 to 4 across 30 different curry leaf accessions. The maximum count of four primary branches was noted in five specific accessions (MK 107, MK118, MK 126, MK141 and MK160). The observation that the cultivar 'Suvasini' exhibited only two primary branches in Peter's study supports the minimum values recorded in the current study.

3.2 Number of secondary branches

The quantity of secondary branches directly impacts the formation of tertiary branches and, consequently, the plant's overall yield potential. Among the evaluated curry leaf

accessions, the number of secondary branches exhibited a broad range, varying from 4 to 15. Accession CL-2 showed the maximum count (12 branches), succeeded by CL-1 with nine. Five accessions—CL-3, CL-4, CL-11, CL-14 and CL-15—all registered eight secondary branches. Three other accessions (CL-9, CL-10 and CL-13) recorded a count of seven. The lowest values were noted in CL-6 (4 branches) and CL-7 (5 branches). The results are in close agreement with the findings of Peter (2019) ^[3], who identified accession MK 141 as having the highest number of secondary branches (8 branches) in their study. Furthermore, Peter's report of five secondary branches in the 'Suvasini' accession aligns well with the lower-end values observed in the current study.

3.3 Number of tertiary branches

The number of tertiary branches is vital for determining the tree's habit and is directly proportional to expected yield. Across the tested curry leaf accessions, tertiary branch development spanned a wide spectrum, from 35 to 75. The highest density of tertiary branching was shared by CL-2 and CL-4, both recording 75 branches, followed immediately by CL-1 and CL-3 (71 branches each). Accessions CL-11 and CL-10 showed a moderate performance, achieving 55 and 51 branches, respectively. Nine accessions clustered at the lower end of the distribution, all exhibiting less than 50 branches. These included CL-9 (48), CL-7 (46), CL-5 (45), CL-6 (43) and CL-8 (41). The minimum branch count (35 branches) was seen in CL-12 and CL-14, with other low performers being CL-15 (36) and CL-13 (38).

These findings generally align with the patterns identified by Peter (2019) ^[3]. In Peter's assessment, accession MK 141 reached the maximum branching level (48 tertiary branches), which mirrors the performance of some of our mid-range accessions. The low tertiary branch count (26) recorded for the 'Suvasini' check variety in that study further supports the existence of significant genotypic variation in this trait.

Table 1: Number of Primary, Secondary and Tertiary branches in curry leaf genotypes

Accession No.	Number of primary branches	Number of secondary branches	Number of tertiary branches
CL- 1	3	9	71
CL- 2	5	12	75
CL- 3	3	8	71
CL- 4	2	8	75
CL- 5	3	6	45
CL- 6	2	4	43
CL- 7	2	5	46
CL- 8	2	6	41
CL- 9	6	7	48
CL- 10	3	7	51
CL- 11	2	8	55
CL- 12	2	6	35
CL- 13	3	7	38
CL- 14	6	8	35
CL- 15	3	8	36
Mean	3.13	7.26	51.00
Range	2-6	4-12	35-75
S. D.	1.40	1.86	14.98
C.V. (%)	44.91	25.72	29.21

3.4 Length of primary branches

The length of the primary branches exhibited considerable variation among the curry leaf accessions, spanning a range from 0.60 m to 1.90 m. The longest primary branch was measured in accession CL-11 (1.90 m), followed closely by CL-

10 (1.80 m). Several accessions showed lengths exceeding 1.50 m, including CL-3 (1.52m), CL-2 (1.50 m) and CL-6 (1.50 m). Accessions displaying branch lengths around the 1.00 m to 1.35 m range included CL-15 (1.35m), CL-14 (1.30 m), CL-7 (1.15 m), CL-8 (1.12 m), CL-9 (1.07 m), CL-1 (1.04 m) and CL-12

(1.00 m). The shortest branches were found in CL-13 (0.60 m), preceded by CL-5 (0.80 m) and CL-4 (0.95 m).

3.5 Length of secondary branches (m)

The length of the secondary branches displayed a wide variation across the curry leaf accessions, ranging from a minimum of 0.54 m to a maximum of 2.70 m. Accession CL-11 registered the longest secondary branch measurement at 2.70 m. The next longest branches were found in CL-6 1.58 m and CL-12 1.57 m, with CL-2 measuring slightly shorter at 1.48 m. A cluster of accessions showed lengths between 1.09 m and 1.30 m, CL-10 (1.30 m), CL-3 (1.20 m), CL-8 (1.10 m) and CL-9 (1.09 m). The shortest secondary branches were recorded in CL-7 (0.54 m), preceded by CL-13 (0.65 m) and CL-5 (0.71 m).

The present results are in accordance with the findings reported by Dharini *et al.* (2022)^[1] results indicated that the mean length of secondary branches in three-year-old curry leaf plants was 0.42 m.

3.6 Length of tertiary branches (m)

Length of tertiary branches varied from 0.55 m to 1.75 m in different curry leaf accessions. The maximum length of tertiary branch was recorded in CL-11 (1.75 m) followed by CL-2 and CL-14 (1.50 m), CL-10 (1.38 m), CL-7 (1.34 m), CL-3 (1.30 m), CL-5 (1.25 m), CL-4 (1.10 m), CL-1 (1.01 m), CL-12 (0.95 m), CL-15 (0.92 m), CL-6 and CL-8 (0.90 m), CL-9 (0.88 m) while the minimum length of tertiary branch was recorded in CL-13 (0.55 m).

Table 2: Length of primary, secondary and tertiary branches in genotypes of curry leaf.

Accession No.	Length of primary branches (m)	Length of secondary branches (m)	Length of tertiary branches (m)
CL- 1	1.04	0.80	1.01
CL- 2	1.50	1.48	1.50
CL- 3	1.52	1.20	1.30
CL- 4	0.95	0.82	1.10
CL- 5	0.80	0.71	1.25
CL- 6	1.50	1.58	0.90
CL- 7	1.15	0.54	1.34
CL- 8	1.22	1.10	0.90
CL- 9	1.07	1.09	0.88
CL- 10	1.80	1.30	1.38
CL- 11	1.90	2.70	1.75
CL- 12	1.00	1.57	0.95
CL- 13	0.60	0.65	0.55
CL- 14	1.30	0.98	1.50
CL- 15	1.35	0.88	0.92
Mean	1.24	1.16	1.19
Range	0.60-1.90	0.65-2.70	0.55-1.75
S.D.	0.35	0.53	0.40
C.V. (%)	28.76	46.37	34.26

4. Conclusion

The minimum number of primary branches were recorded in CL-4, CL-6, CL-7, CL-8, CL-11 and CL-12 (2 branches). The maximum number of primary branches were recorded in CL-9 and CL-14. While the maximum number of secondary branches were recorded in CL-2 (12 branches). The lowest number of secondary branches were found in CL-6 (4 branches). The maximum number of tertiary branches were recorded in CL-2 and CL-4 (75 branches). The lowest number of tertiary branches were recorded in CL-12 and CL-14 (35 branches).

The highest length of primary branch was obtained in CL-11 (190 cm) followed by CL-10 (180 cm) and the lowest length of primary branch was obtained in CL-13 (60 cm). The highest length of secondary branch was recorded in CL-11 (270 cm) followed by CL-6 (158 cm) and the lowest length of secondary branches was recorded in CL-7 (54 cm). The highest length of tertiary branch was recorded in CL-11 (175 cm) followed by CL-2 and CL-14 (150 cm) and the lowest length of tertiary branch was recorded in CL-13 (55 cm).

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