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A Study on Morphological and Rhizome Characteristics of Mydukur and Sudarsana Varieties of Turmeric (*Curcuma longa* L.)

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Abstract: ***Turmeric (*Curcuma longa *L.) is a perennial rhizomatous spice crop belonging to the family* Zingiberaceae *and is valued for its culinary, medicinal and economic importance. Its rhizomes are rich in curcumin, a bioactive compound with antioxidant, anti-inflammatory, antimicrobial and anticancer properties. India is the leading producer, consumer and exporter of turmeric worldwide. The present investigation was undertaken to assess the morphological and rhizome characteristics of the turmeric (*Curcuma longa *L.) varieties Mydukur and Sudarsana. Data were recorded on plant height, number of leaves, leaf width, tillers per clump and the weights of mother, primary and secondary rhizomes. The recorded observations demonstrated variability in vegetative and rhizome characters among the varieties. The study generated valuable baseline information for varietal characterization and the identification of promising turmeric varieties with desirable growth and rhizome attributes under the prevailing agro-climatic conditions.***

Keywords: Mydukur, Sudarsana, Morphological characterization and Rhizome

1. Introduction

Turmeric (*Curcuma longa* L.) is perennial rhizomatous herb of the family Zingiberaceae and one of the most important spice and medicinal crops cultivated in tropical and subtropical climates. The crop is highly valued for its culinary, pharmaceutical and nutraceutical applications due to the presence of curcuminoids and essential oils. The dried rhizomes are also a rich source of nutrients, comprising approximately 6.3% proteins, 5.1% lipids, 69.4% carbohydrates and 3.5% minerals, making turmeric an economically and nutritionally important crop [1, 2, 3].

Indian turmeric is widely recognized for its superior quality in international markets. In 2022–23, turmeric cultivation covered approximately 3.24 lakh hectares with a production of 11.61 lakh tonnes representing nearly 75% of global output. More than 30 turmeric varieties are cultivated in Indian. The major states producing turmeric in India are Telangana, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Madhya Pradesh and West Bengal [4]. India also contributes more than 62% of the global turmeric trade highlighting its leading role in the international spice sector [5, 6]. Turmeric is a nutrient-demanding crop requiring adequate organic amendments and balanced fertilization to sustain optimum growth and rhizome yield. However, productivity is frequently affected by insect pests and diseases, including rhizome scale and fungal pathogens. Therefore, integrated nutrient and pest management strategies involving organic inputs, biological agents and judicious use of fungicides and insecticides are essential for maintaining crop health and maximizing productivity [7]. India possesses a wide range of turmeric cultivars reflecting the crop's rich genetic diversity and adaptation to diverse agro-climatic conditions. These cultivars are generally identified by the names of the regions where they are predominantly cultivated, such as Salem, Duggirala, Mydukur, Armoor, Tekkurpet, Amalapuram, Erode, Sangli and Lakadong. To improve productivity and quality, ICAR–Indian Institute of Spices Research (ICAR–IISR) has developed and released several improved turmeric varieties characterized by superior rhizome yield, higher curcumin content and improved tolerance to major pests and diseases [8].

Sudarsana is an improved turmeric (*Curcuma longa* L.) variety developed by ICAR–Indian Institute of Spices Research (ICAR–IISR), Kozhikode. It is a short-duration (180-200 days), high fresh-yielding (54.9 t/ha), 7.9% curcumin, 15.0% oleoresin, 7.0% essential oil and 20.6% dry recovery. The variety also exhibits moderate tolerance to rhizome rot and leaf blotch making it suitable for commercial cultivation and processing industries [9].

The Mydukur turmeric variety is a popular long-duration (about 9 months) local cultivar cultivated mainly in the Kadapa district of Andhra Pradesh. It is widely preferred because of its high rhizome yield, good adaptation to black soils and suitability for commercial cultivation. Drip fertigation improves nutrient use efficiency by delivering fertilizers directly to the root zone. The study evaluated the effect of different fertigation levels on the growth and yield of turmeric cv. Mydukur [10]. Turmeric can serve as a promising alternative to rice in Karnataka's hilly Zone IX, with IISR Prathibha and Mydukur local exhibiting superior adaptability, rhizome yield, net returns, and benefit–cost ratio [11]. Kadapa district of Andhra Pradesh, particularly Mydukur and Duvvur mandals, is a major turmeric-growing region [12].

Morphological and rhizome characterization provides valuable information on the growth performance and yield attributes of turmeric (*Curcuma longa* L.) varieties. Therefore, the present study was undertaken to evaluate the morphological and rhizome characteristics of the Sudarsana and Mydukur varieties.

2. Materials and Methods

Experimental Site:
Field experiment was conducted during the Kharif season of 2025 at a farmer's field in Chikhali, Dist Nanded (Maharashtra) to evaluate the morphological and rhizome characteristics of two turmeric (*Curcuma longa* L.) varieties namely Mydukur and Sudarsana. Morphological observations were recorded at 180 days after planting (DAP) while rhizome characteristics were assessed at harvest.

Cultivation (Planting) Method:
Turmeric was planted using the ridges and furrows method which provides efficient drainage and irrigation, reduces water stagnation and rhizome rot incidence and is well suited for drip irrigation.

Sowing of Rhizome and Fertilizers Application:
Healthy well-developed and disease-free finger rhizomes were used as planting material. Rhizome were collected from turmeric research station (BTHRTC) Vasmat, Dist Hingoli. Rhizomes were planted on beds (120 cm wide and 20 cm high) at a spacing of 30 cm between rows and 12.5 cm between plants with irrigation provided through the furrows. Fertilizers were applied as per the recommended package of practices followed by local farmers.

Morphological and Rhizome Characteristics:
Morphological characteristics including plant height, number of leaves per clump, number of tillers per clump, leaf length and leaf width were recorded at 180 days after planting (DAP). After harvest, rhizome characteristics, including the fresh weights of mother, primary and secondary rhizomes per clump were recorded.

Table 1: Morphological and Rhizome Characterisics of Mydukur and Sudarsana Varieties of Turmeric (*Curcuma longa* L.).

Name of the Turmeric Variety	Plant height (cm)	No of leaves/clump	Length of leaf (cm)	Length of leaf width (cm)	No of tiller /clump	Mother rhizome weight (g/clump)	Primary rhizome weight (g/clump)	Secondary rhizome weight (g/clump)
Mydukur	90.2	10.32	37.43	11	4.2	64. 3	259.2	37.4
Sudarsana	142	12.6	36	10.9	5.7	58.72	232	298

Note: Morphological characters were recorded at 180 DAP while rhizome characteristics were recorded at harvest**.**

3. Result and Discussion

The data presented in Table 1 showed that the Mydukur turmeric variety exhibited satisfactory vegetative growth and rhizome development under the prevailing experimental conditions. At 180 DAP, the variety recorded a mean plant height of 90.20 cm, with an average of 10.32 leaves and 4.20 tillers per clump. The mean leaf length and leaf width were 37.43 cm and 11.00 cm respectively. At harvest, the Mydukur variety recorded a mean mother rhizome weight of 64.30 g per clump, while the primary and secondary rhizomes weighed 259.20 g and 37.4 g per clump, respectively. The greater biomass accumulation in the primary and secondary rhizomes indicates efficient assimilate partitioning and rhizome bulking during crop growth.

Similarly, the data presented in Table-1 showed that the Sudarsana turmeric variety exhibited vigorous vegetative growth and good rhizome development. It recorded a plant height of 142.0 cm**,** 12.6 leaves and 5.7 tillers per clump**.** The average leaf length and leaf width were 36.0 cm and 10.9 cm respectively. At harvest, the variety produced a mother rhizome weight of 58.72 g per clump**,** primary rhizome weight of 232.0 g per clump and secondary rhizome weight of 298.0 g per clump. The higher weight of secondary rhizomes indicates better rhizome proliferation and contributes to the overall yield. These findings suggest that the Sudarsana variety possesses good vegetative growth, efficient rhizome development and high yield potential under the experimental conditions.

References

[1] **D. Manjusha1, S. Suryakumari, K. Giridhar, A.V.D. Dorajeerao, D.R. Salomi Suneetha, P. Subbaramamma and V. Sivakumar [2019]:** Studies on growth and yield of turmeric under different irrigation and nutrient management strategies at West Bengal, India. Biological Forum International Journal 15(3): 212-220(2023).

[2] **Pandey, D.K., Mishra, D.P. and Mustafa, Md. [2011]:** Response of various level of nitrogen and plant spacing on yield and yield attributing characters of turmeric (*Curcuma longa* L.) at farmer's field of Azamgarh, U.P. Progressive Horticulture, 43(2): 320-322.

[3] **Shakur, M.A. [2000]:** Turmeric cultivation method (Bengali), Spices Research Centre, Bangladesh Agricultural Research Institute, Bogra, Bangladesh.

[4] **Harsha K N, Kavya S, Manuval Joseph, Veeresh N, Karuppa Samy K [2026]:** Varietal evaluation of different turmeric (*Curcuma longa* L.) varieties for its suitability to hilly zone of Karnataka International Journal of Botany Studies ISSN: 2455-541 X, Volume 11, Issue 1, 120-122.

[5] **SM Khedkar, Pooja S Sawant, NA Meshram, NV Dalvi, NH Khobragade, Suchitra S Desai, CS Chaudhari, SY Rakhonde, PP Sambhare, SV Nevase and KW Jadhav [2024]:** Effect of manures and fertilizers on growth, yield and economics of turmeric in lateritic soils of Konkan, International Journal of Statistics and Applied Mathematics, 9(5): 303-306.

[6] **Kadam JH, Kamble BM [2020]:** Effect of organic manures on growth, yield and quality of turmeric (*Curcuma longa* L). J Appl Nat Sci.;12 (2):91-97.

[7] **Shailendra Kumar, Vipin, Shubham Kumar and Nikhil Kumar Singh [2024]:** A Text Book on the Scientific Cultivation of Vegetables and Spices Crops Golden Leaf Publishers, ISBN: 978-81-19906-46-8.

[8] **Sanjay Kumar Rai1, Krishna Kumar Rai2, Neha Pandey, Anjana Kumari, Deepika Tripathi and Shashi Pandey Rai (2016):** Varietal performance of turmeric (*Curcuma longa* L.) with special reference to curcumin and essential oil content under climatic

conditions of Indogangetic plains,Vegetable Science, 43 (1): 36-43.

[9] **S. Salma A, S. Aariba B, M. Velvizhi C, N. Yasmin D, U.V. Sudha C, M.C. Anitha E, S. Naveena Reddy [2022]:** a Qualitative phytochemical analysis of eight turmeric (Curcuma longa L) cultivars grown in various geographical locations of India with six extracts. A comparative study, Materials Today: Proceedings, https://doi.org/10.1016/j.matpr. 04.641.

[10] **Syed Sadarunnisa, C. Madhumathi, G. Srinivasa Rao and B. Sreenivasulu J. [2010**]: Effect of fertigation on growth and yield of turmeric cv. Mydukur, Hortl. Sci. Vol. 5 (1): 78-80.

[11] **Harsha K N, Kavya S, Manuval Joseph, Veeresh N, Karuppa Samy K [2026]:** Varietal evaluation of different turmeric (Curcuma longa L.) varieties for its suitability to hilly zone of Karnataka, International Journal of Botany Studies, ISSN: 2455-541X, Volume 11(I), 120-122.

[12] **Settipalli Sravani, S. V. Prasad, P. L. R. J. Praveena and G. Karuna Sagar [2022]:** Strategy to Improve the Marketing Behaviour of Turmeric Farmers in Kadapa District of Andhra Pradesh, Asian Journal of Agricultural Extension, Economics & Sociology, ISSN: 2320-7027, 40(8), 179-183.