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A review on varietal evaluation of tuberose (*Agave amica*) for flowering and spike quality

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Abstract
Tuberose (*Agave amica*.), an important commercial bulbous ornamental crop belonging to the family Asparagaceae, is widely cultivated for its fragrant flowers and attractive floral spikes. It has considerable economic importance in loose-flower and cut-flower industries owing to its fragrance, elegance, long spike length and suitability for floral arrangements. Varietal selection plays a significant role in determining spike emergence, spike length, rachis length, number of florets per spike and overall flower productivity. Considerable variability has been reported among tuberose varieties for these characters under different agroclimatic conditions. Several cultivars, including Prajwal, Arka Nirantara, Arka Suvasini, Suvasini, Vaibhav, Shringar, Calcutta Single and Mexican Single, have demonstrated promising performance for different spike and yield attributes. Among the reported observations, Arka Prajwal recorded the maximum spike length of 111.80 cm, while Arka Vaibhav produced the highest number of florets per spike (63.00). Arka Nirantara recorded the maximum rachis length of 59.00 cm in the Gogoi *et al.* (2020) evaluation, whereas early spike emergence was reported in several genotypes depending on the experimental environment. This review consolidates published varietal evaluation findings to identify promising genotypes, compare their floral performance and provide useful information for selecting suitable cultivars for commercial tuberose cultivation.

Keywords: Tuberose, Varietal evaluation, Spike length, Rachis length, Florets per spike, Floral quality

Introduction

Tuberose (*Agave amica*), commonly known as Rajnigandha, is an important bulbous ornamental plant belonging to the family Asparagaceae. It is believed to have originated in Mexico and is widely cultivated in tropical and subtropical regions of the world. The crop is particularly valued for its attractive white flowers, elegant floral spikes and characteristic sweet fragrance. Due to its ornamental and aromatic properties, tuberose occupies an important position in commercial floriculture and the perfume industry. In India, it is cultivated in several states for loose-flower production, cut-flower purposes, garland preparation, religious ceremonies, bouquets and decorative arrangements.

The flowers of tuberose possess a pleasant and long-lasting fragrance, making them suitable for the extraction of essential oils and aromatic compounds used in the perfume and cosmetic industries. The individual florets are commonly used for making garlands, floral ornaments and religious offerings, while the long flowering spikes are preferred for bouquets, vase arrangements and interior decoration. Based on flower form, tuberose varieties are broadly classified into single-flowered and double-flowered types. Single-flowered varieties are generally preferred for essential oil extraction and loose-flower purposes because of their fragrance, whereas double-flowered varieties are valued for their attractive floral appearance and ornamental use.

The commercial productivity and quality of tuberose are strongly influenced by genetic characteristics, environmental conditions and crop management practices. Different varieties exhibit considerable variation in vegetative growth, flowering behaviour, spike production, spike length, rachis length, number of florets per spike and flower longevity. These variations are important because the market value of tuberose depends not only on the quantity of flowers produced but also on the physical appearance, fragrance, uniformity and overall quality of the floral spikes. Varieties producing longer and stronger spikes with a well-developed rachis and a greater number of uniformly distributed florets are generally considered desirable for cut-flower production.

Spike emergence is an important flowering character that determines the earliness of a variety and influences the timing of flower availability in the market. Early-emerging varieties may provide opportunities for obtaining flowers during favourable market periods. Similarly, spike length is considered one of the major commercial quality parameters, particularly for cut-flower production, as longer spikes are generally pre

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ferred for bouquet preparation and floral arrangements. Rachis length also plays an important role in determining the distribution and arrangement of florets along the spike, thereby influencing its appearance and ornamental attractiveness. Furthermore, the number of florets per spike is an important yield and quality component because spikes bearing more florets generally provide greater floral fullness and decorative value.

3.3. Comparative interpretation of flowering and spike-quality parameters in different varieties of tuberose

Considerable variation was observed among tuberose varieties with respect to days taken to spike emergence, spike length, rachis length and number of florets per spike, as reported by different researchers. The comparative findings for each parameter are discussed below.

Table 1. Comparative performance of Tuberose varieties for flowering and spike quality parameters

S.No.	Variety	Days taken to spike emergence	Spike Length (cm)	Rachis length (cm)	Number of florets/ spike	Reference
1.	Calcutta Double	88	58.92	38.75	35.00	Ranchana *et. al*. (2013)
2.	Hyderabad Double	89	53.87	33.95	34.00	Ranchana *et. al*. (2013)
3.	Peral Double	86	54.70	42.67	30.00	Ranchana *et. al*. (2013)
4.	Suvasini	84	71.25	44.00	54.00	Ranchana *et. al*. (2013)
5.	Vaibhav	85	66.38	54.00	44.00	Ranchana *et. al*. (2013)
6.	Hydrabad Single	76.17	70.50	41.00	33.83	Gogoi *et. al. (*2020)
7.	Calcutta Single I	79.67	84.17	45.83	36.00	Gogoi *et. al. (*2020)
8.	Calcutta Single II	82.16	68.50	41.00	27.67	Gogoi *et. al. (*2020)
9.	Arka Nirantara	74.83	87.83	59.00	36.83	Gogoi *et. al. (*2020)
10.	Prajwal	76.50	75.17	51.83	35.16	Gogoi *et. al. (*2020)
11.	Shringar	78.00	83.17	54.83	36.67	Gogoi *et. al. (*2020)
12.	Jorhat Collection	79.67	78.66	47.00	31.33	Gogoi *et. al. (*2020)
13.	Guwahati Single	79.50	77.96	41.17	33.83	Gogoi *et. al. (*2020)
14.	Hajo Locale	78.67	73.67	38.16	31.17	Gogoi *et. al. (*2020)
15.	Maxican Single	79.50	80.83	50.83	36.33	Gogoi *et. al. (*2020)
16.	Phule Rajani	80.16	81.83	45.17	33.00	Gogoi *et. al. (*2020)
17.	Sikkim Selection	81.00	72.83	49.50	23.66	Gogoi *et. al. (*2020)
18.	Bidhan Rajani I	78.00	63.67	40.33	35.16	Gogoi *et. al. (*2020)
19.	Bidhan Rajani II	77.50	53.67	36.33	30.83	Gogoi *et. al. (*2020)
20.	Maxican Single	101.00	103.79	34.15	42.65	Ramachandrudu *et. al.* (2009)
21.	Shringar	104.50	76.95	26.36	44.77	Ramachandrudu *et. al.* (2009)
22.	Suvasini	109.00	91.54	50.52	57.46	Ramachandrudu *et. al.* (2009)
23.	Prajwal	110.50	97.78	33.75	51.39	Ramachandrudu *et. al.* (2009)
24.	Vaibhav	104.00	91.25	56.03	55.65	Ramachandrudu *et. al.* (2009)
25.	Pear Double	36.45	61.64	22.83	37.54	Singh and Singh (2013) [13]
26.	Suvasini	41.11	80.38	42.35	47.05	Singh and Singh (2013) [13]
27.	Vaibhav	36.45	58.38	58.38	45.38	Singh and Singh (2013) [13]
28.	Hyderabad Double	41.11	67.80	67.80	43.38	Singh and Singh (2013) [13]
29.	Arka Vaibhav	71.83	91.17	44.53	63.00	Hasna *et. al.* (2021)
30.	Arka Prajwal	68.12	111.80	40.00	51.67	Hasna *et. al.* (2021)
31.	Arka Niranthara	82.46	92.53	36.47	50.67	Hasna *et. al.* (2021)
32.	Arka shringar	63.25	75.20	30.20	53.80	Hasna *et. al.* (2021)
33.	Arka Suvasini	65.08	109.07	47.60	62.10	Hasna *et. al.* (2021)
34.	Arka Sugandhi	66.82	65.87	32.07	60.20	Hasna *et. al.* (2021)
35.	Bidan Ujwal	65.88	65.73	24.90	51.40	Hasna *et. al.* (2021)
36.	Phule Rajani	69.13	76.60	35.10	51.20	Hasna *et. al.* (2021)
37.	Culcutta Single	68.54	106.00	37.60	47.47	Hasna *et. al.* (2021)
38.	Culcutta Double	88.88	101.07	44.77	56.80	Hasna *et. al.* (2021)
39.	Prajwal	-	110.45	35.44	41.86	Kumar *et. al.* (2020)
40.	Mexican Single	-	99.64	36.43	34.40	Kumar *et. al.* (2020)
41.	Sikkim Selection	-	86.81	21.65	23.45	Kumar *et. al.* (2020)
42.	ArkaNirantara	-	72.53	34.48	33.67	Kumar *et. al.* (2020)
43.	Phule Rajani	-	78.70	37.63	38.25	Kumar *et. al.* (2020)
44.	Hydarabad Single	-	71.42	28.67	37.50	Kumar *et. al.* (2020)
45.	Shringar	-	76.57	37.52	36.96	Kumar *et. al.* (2020)

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46.	STR- 505	-	80.67	33.56	35.56	Kumar *et. al.* (2020)
47.	Arka Sugandhi	-	73.11	37.39	39.00	Kumar *et. al.* (2020)
48.	Pune Local Single	-	91.35	20.40	28.48	Kumar *et. al.* (2020)
49.	Bidhan Ujjwal	-	55.41	26.11	28.37	Kumar *et. al.* (2020)
50.	Bidhan Snigdha	-	89.40	48.64	36.45	Kumar *et. al.* (2020)
51.	GK TC-4	-	69.45	36.41	41.11	Kumar *et. al.* (2020)
52.	Prajwal	-	111.00	31.53	60.33	Prakash *et. al.* (2015)
53.	Arka Nirantra	-	93.16	26.40	52.30	Prakash *et. al.* (2015)
54.	Sringar	-	82.25	20.22	51.15	Prakash *et. al.* (2015)
55.	Phule Rajani	-	91.50	27.50	57.50	Prakash *et. al.* (2015)
56.	Mexican Single	-	93.30	15.10	40.40	Prakash *et. al.* (2015)
57.	Arka Nirantra	-	80.60	25.67	34.80	Rajput *et. al.* (2022)
58.	Calcutta Single	-	71.40	27.20	32.47	Rajput *et. al.* (2022)
59.	GK TC-4	-	71.27	26.57	30.20	Rajput *et. al.* (2022)
60.	Hydarabad Single	-	79.20	25.07	33.47	Rajput *et. al.* (2022)
61.	Maxican Single	-	65.73	25.93	43.47	Rajput *et. al.* (2022)
62.	Phule Rajani	-	89.60	26.47	40.20	Rajput *et. al.* (2022)
63.	Prajwal	-	93.27	31.00	48.87	Rajput *et. al.* (2022)
64.	Pune Local Single	-	75.93	23.47	39.47	Rajput *et. al.* (2022)
65.	Shringar	-	77.60	27.60	41.27	Rajput *et. al.* (2022)
66.	Sikkim Selection-6	-	92.93	18.33	45.53	Rajput *et. al.* (2022)
67.	Maxican Single	112.00	75.59	-	37.08	Safeena *et. al.* (2019)
68.	Calcutta Single	114.17	68.17	-	35.22	Safeena *et. al.* (2019)
69.	Hydarabad Single	137.27	61.02	-	45.05	Safeena *et. al.* (2019)
70.	Pune Local Single	123.41	62.09	-	37.16	Safeena *et. al.* (2019)
71.	Pule Rajani	131.07	58.11	-	38.05	Safeena *et. al.* (2019)
72.	Prajwal	92.60	87.30	40.20	55.60	Shivkumar *et. al.* (2020)
73.	Pule Rajani	101.50	75.10	36.90	50.40	Shivkumar *et. al.* (2020)
74.	Sikkim Selection	-	108.40	32.53	30.67	Madhumati *et. al*. (2018)
75.	Shringar	-	59.93	26.80	29.00	Madhumati *et. al*. (2018)
76.	Calcutta Single	-	75.73	24.13	27.60	Madhumati *et. al*. (2018)
77.	GKTC-4	-	56.00	23.93	31.87	Madhumati *et. al*. (2018)
78.	Prajwal	-	76.53	33.40	30.93	Madhumati *et. al*. (2018)
79.	Hyderabad Single	-	55.93	25.20	31.47	Madhumati *et. al*. (2018)
80.	Rajat Rekha	-	74.80	30.20	29.33	Madhumati *et. al*. (2018)
81.	Arka Niranthara	-	71.87	31.87	26.80	Madhumati *et. al*. (2018)
82.	Phule Rajani	-	59.80	25.17	27.77	Madhumati *et. al*. (2018)
83.	Arka Shringar	136.03	65.77	19.77	49.33	Bharathi and Umamaheswari (2018) [6]
84.	Prajwal	112.37	91.77	25.78	49.20	Bharathi and Umamaheswari (2018) [6]
B						
85.	Arka Nirantra	117.80	97.55	20.54	51.90	Bharathi and Umamaheswari (2018) [6]
86.	Maxican Single	130.60	90.70	17.28	46.53	Bharathi and Umamaheswari (2018) [6]
87.	Shringar	71.27	67.67	25.24	37.73	Singh *et. al*. (2018)
88.	Calcutta Double	51.60	78.46	27.74	27.40	Singh *et. al*. (2018)
89.	Vaibhav	52.40	73.89	32.75	37.73	Singh *et. al*. (2018)
90.	GK TC-4	61.93	69.79	24.62	40.13	Singh *et. al*. (2018)
91.	Sikkim Selection	43.93	55.30	16.68	23.67	Singh *et. al*. (2018)
92.	Prajwal	72.40	83.87	24.73	34.13	Singh *et. al*. (2018)
93.	Hyderabad Single	69.20	67.61	25.74	36.07	Singh *et. al*. (2018)
94.	Phule Rajani	65.07	62.44	22.39	44.87	Singh *et. al*. (2018)
95.	ACC NO.-9	80.93	84.99	34.01	36.00	Singh *et. al*. (2018)
96.	Pune Local Single	41.20	63.19	18.92	41.67	Singh *et. al*. (2018)
97.	Arka Niranthara	60.80	98.48	20.51	22.95	Singh *et. al*. (2018)
98.	ACC No-7	70.40	41.71	14.13	36.73	Singh *et. al*. (2018)
99.	Caulcutta Single	51.60	71.94	23.15	35.47	Singh *et. al*. (2018)
100.	Mexican Single	53.47	56.34	10.59	20.07	Singh *et. al*. (2018)

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1. Days taken to spike emergence

Ranchana *et al.* (2013) [1] reported that Suvasini took the minimum number of days for spike emergence (84 days), followed by Vaibhav (85 days), Pearl Double (86 days), Calcutta Double (88 days) and Hyderabad Double (89 days). In comparison, Gogoi *et al.* (2020) [2] recorded the earliest spike emergence in Arka Nirantara (74.83 days), followed by Hyderabad Single (76.17 days), Prajwal (76.50 days) and Bidhan Rajani II (77.50 days). The maximum number of days was recorded in Calcutta Single II (82.16 days).

Ramachandrudu *et al.* (2009) [3] reported that Mexican Single took 101 days for spike emergence, whereas Suvasini required 109 days, Prajwal 110.50 days and Vaibhav 104 days. Singh and Singh (2023) recorded 36.45 days in Pearl Double and Vaibhav, while Suvasini and Hyderabad Double required 41.11 days. Hasna *et al.* (2021) reported the minimum number of days in Arka Shringar (63.25 days), followed by Arka Suvasini (65.08 days), Arka Sugandhi (66.82 days) and Arka Prajwal (68.12 days). In contrast, Arka Nirantara required 82.46 days.

Safeena *et al.* (2019) [4] recorded the earliest spike emergence in Prajwal (92.60 days), followed by Mexican Single (112 days), Calcutta Single (114.17 days), Pune Local Single (123.41 days) and Phule Rajani (131.07 days). Shivkumar *et al.* (2020) [5] reported 92.60 days for Prajwal and 101.50 days for Phule Rajani. Bharathi *et al.* (2018) [6] recorded 112.37 days in Prajwal, 117.80 days in Arka Nirantara, 130.60 days in Mexican Single and 136.03 days in Arka Shringar. Singh *et al.* (2018) [7] reported the minimum number of days in Sikkim Selection (43.93 days), followed by Pune Local Single (41.20 days), Vaibhav (52.40 days) and Calcutta Double (51.60 days).

2. Spike length (cm)

Spike length differed considerably among varieties and studies. Ranchana *et al.* (2013) [1] recorded the maximum spike length in Suvasini (71.25 cm), followed by Hyderabad Single (70.50 cm), Vaibhav (66.38 cm), Pearl Double (54.70 cm) and Hyderabad Double (53.87 cm). In comparison, Gogoi *et al.* (2020) [2] reported the longest spike in Arka Nirantara (87.83 cm), followed by Calcutta Single I (84.17 cm), Shringar (83.17 cm), Mexican Single (80.83 cm) and Jorhat Collection (78.66 cm). The minimum spike length was recorded in Bidhan Rajani II (53.67 cm).

Ramachandrudu *et al.* (2009) [3] reported the maximum spike length in Mexican Single (103.79 cm), followed by Prajwal (97.78 cm), Suvasini (91.54 cm), Vaibhav (91.25 cm) and Shringar (76.95 cm). Singh and Singh (2023) recorded 80.38 cm in Suvasini, 67.80 cm in Hyderabad Double, 61.64 cm in Pearl Double and 58.38 cm in Vaibhav.

Hasna *et al.* (2021) observed the maximum spike length in Arka Prajwal (111.80 cm), closely followed by Arka Suvasini (109.07 cm), Calcutta Double (101.07 cm), Arka Nirantara (92.53 cm) and Arka Vaibhav (91.17 cm). Arka Sugandhi recorded 65.87 cm, while Bidhan Ujwal exhibited 65.73 cm. Kumar *et al.* (2020) reported the longest spike in Prajwal (110.45 cm), followed by Mexican Single (99.64 cm), Pune Local Single (91.35 cm), Bidhan Snigdha (89.40 cm) and Sikkim Selection (86.81 cm).

Prakash *et al.* (2015) [8] recorded a spike length of 111.00 cm in Prajwal, followed by Arka Nirantara (93.16 cm), Mexican Single (93.30 cm), Phule Rajani (91.50 cm) and Shringar (82.25 cm). Rajput *et al.* (2022) [9] reported the maximum spike length in Prajwal (93.27 cm), followed by Phule Rajani (89.60 cm), Sikkim Selection-6 (92.93 cm), Shringar (77.60 cm) and Pune Local Single (75.93 cm). Arka Nirantara recorded 80.60 cm in the same study.

Safeena *et al.* (2019) [4] reported the maximum spike length in Mexican Single (75.59 cm), followed by Calcutta Single (68.17 cm), Hyderabad Single (61.02 cm), Pune Local Single (62.09 cm) and Phule Rajani (58.11 cm). Shivkumar *et al.* (2020) [5] recorded 87.30 cm in Prajwal and 75.10 cm in Phule Rajani. Madhumati *et al.* (2018) [10] reported the longest spike in Sikkim Selection (108.40 cm), followed by Prajwal (76.53 cm), Calcutta Single (75.73 cm) and Rajat Rekha (74.80 cm).

Bharathi *et al.* (2018) [6] recorded the maximum spike length in Arka Nirantara (97.55 cm), followed by Prajwal (91.77 cm), Mexican Single (90.70 cm) and Arka Shringar (65.77 cm). Singh *et al.* (2018) [7] reported the highest spike length in Arka Nirantara (98.48 cm), followed by ACC No.-9 (84.99 cm), Prajwal (83.87 cm), Calcutta Double (78.46 cm) and Vaibhav (73.89 cm).

3. Rachis length (cm)

Rachis length also exhibited considerable differences among the varieties. Ranchana *et al.* (2013) [1] reported the maximum rachis length in Vaibhav (54.00 cm), followed by Suvasini (44.00 cm), Pearl Double (42.67 cm), Calcutta Double (38.75 cm) and Hyderabad Double (33.95 cm). Gogoi *et al.* (2020) [2] recorded the longest rachis in Arka Nirantara (59.00 cm), followed by Shringar (54.83 cm), Prajwal (51.83 cm), Mexican Single (50.83 cm) and Sikkim Selection (49.50 cm).

Ramachandrudu *et al.* (2009) [3] reported the maximum rachis length in Vaibhav (56.03 cm), followed by Suvasini (50.52 cm), Mexican Single (34.15 cm), Prajwal (33.75 cm) and Shringar (26.36 cm). Singh and Singh (2023) recorded 67.80 cm in Hyderabad Double, 58.38 cm in Vaibhav, 42.35 cm in Suvasini and 22.83 cm in Pearl Double.

Hasna *et al.* (2021) observed the maximum rachis length in Arka Vaibhav (44.53 cm), followed by Arka Suvasini (47.60 cm), Arka Prajwal (40.00 cm), Arka Nirantara (36.47 cm) and Phule Rajani (35.10 cm). Kumar *et al.* (2020) reported the highest rachis length in Bidhan Snigdha (48.64 cm), followed by Phule Rajani (37.63 cm), Shringar (37.52 cm), Arka Sugandhi (37.39 cm) and Mexican Single (36.43 cm).

Prakash *et al.* (2015) [8] recorded 31.53 cm in Prajwal, 27.50 cm in Phule Rajani, 26.40 cm in Arka Nirantara, 20.22 cm in Shringar and 15.10 cm in Mexican Single. Rajput *et al.* (2022) [9] reported the highest rachis length in Prajwal (31.00 cm), followed by Shringar (27.60 cm), Phule Rajani (26.47 cm), Arka Nirantara (25.67 cm) and Mexican Single (25.93 cm).

Shivkumar *et al.* (2020) [5] recorded 40.20 cm in Prajwal and 36.90 cm in Phule Rajani. Madhumati *et al.* (2018) [10] reported the maximum rachis length in Prajwal (33.40 cm), followed by Arka Nirantara (31.87 cm), Rajat Rekha (30.20 cm), Shringar (26.80 cm) and Hyderabad Single (25.20 cm). Bharathi *et al.* (2018) [6] recorded 25.78 cm in Prajwal, 20.54 cm in Arka Nirantara, 19.77 cm in Arka Shringar and 17.28 cm in Mexican Single. Singh *et al.* (2018) [7] reported the maximum rachis length in ACC No.-9 (34.01 cm), followed by Vaibhav (32.75 cm), Shringar (25.24 cm), Prajwal (24.73 cm) and Calcutta Single (23.15 cm).

4. Number of florets per spike

The number of florets per spike varied among the varieties evaluated by different researchers. Ranchana *et al.* (2013) [1] recorded the maximum number of florets in Suvasini (54.00), followed by Vaibhav (44.00), Calcutta Double (35.00), Hyderabad Double (34.00) and Pearl Double (30.00). Among the varieties in that study, Arka Nirantara recorded 36.83 florets per spike, followed by Shringar (36.67), Mexican Single (36.33), Calcutta Single I (36.00) and Prajwal and Bidhan Rajani I (35.16).

Ramachandrudu *et al.* (2009) [3] recorded the maximum number of florets in Suvasini (57.46), followed by Vaibhav (55.65), Prajwal (51.39), Shringar (44.77) and Mexican Single (42.65). Singh and Singh (2023) reported 47.05 florets per spike in Suvasini, 45.38 in Vaibhav, 43.38 in Hyderabad Double and 37.54 in Pearl Double.

Hasna *et al.* (2021) observed the maximum number of florets in Arka Vaibhav (63.00), followed by Arka Suvasini (62.10), Arka Sugandhi (60.20), Calcutta Double (56.80), Arka Shringar (53.80) and Arka Prajwal (51.67). Kumar *et al.* (2020) reported the highest number in GK TC-4 (41.11), followed by Prajwal (41.86), Arka Sugandhi (39.00), Phule Rajani (38.25) and Hyderabad Single (37.50).

Prakash *et al.* (2015) [8] recorded the maximum number of florets in Prajwal (60.33), followed by Phule Rajani (57.50), Arka Nirantara

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(52.30), Shringar (51.15) and Mexican Single (40.40). Rajput *et al.* (2022) [9] reported the highest number in Mexican Single (43.47), followed by Pune Local Single (39.47), Phule Rajani (40.20), Prajwal (48.87) and Shringar (41.27).

Safeena *et al.* (2019) [4] observed 45.05 florets per spike in Hyderabad Single, 38.05 in Phule Rajani, 37.16 in Pune Local Single, 37.08 in Mexican Single and 35.22 in Calcutta Single. Shivkumar *et al.* (2020) [5] recorded 55.60 florets in Prajwal and 50.40 in Phule Rajani. Madhumati *et al.* (2018) [10] reported the highest number in GK TC-4 (31.87), followed by Hyderabad Single (31.47), Prajwal (30.93), Sikkim Selection (30.67) and Rajat Rekha (29.33).

Bharathi *et al.* (2018) [6] recorded 51.90 florets per spike in Arka Nirantara, 49.20 in Prajwal, 49.33 in Arka Shringar and 46.53 in Mexican Single. Singh *et al.* (2018) [7] reported the maximum number in Phule Rajani (44.87), followed by GK TC-4 (40.13), Vaibhav and Shringar (37.73 each), ACC No.-7 (36.73) and Hyderabad Single (36.07).

Conclusion

Across the studies, Arka Prajwal recorded the highest spike length of 111.80 cm, as reported by Hasna *et al.* (2021), while Prajwal recorded 111.00 cm in Prakash *et al.* (2015) [8]. The highest rachis length was 67.80 cm in Hyderabad Double, reported by Singh and Singh (2023). The maximum number of florets per spike was 63.00 in Arka Vaibhav, as reported by Hasna *et al.* (2021). For days to spike emergence, the lowest reported value was 36.45 days in Pearl Double and Vaibhav according to Singh and Singh (2023).

These differences indicate substantial variation in flowering and spike-quality characteristics among tuberose varieties and across research environments. Such variation may be related to genetic makeup, climatic conditions, crop management, planting material and experimental procedures. Therefore, the reported values provide a comparative overview of varietal performance rather than a direct ranking under identical growing conditions.

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