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Short review on sensory evaluation of single type tuberose

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Abstract

Tuberose (*Agave amica* syn. *Polygonatum tuberosum* L.) possessed vast potential of uses viz. loose and cut flower trade, long vase life, along with essential aromatic components for oil industry in the world market (Kumar *et al.*, 2021). Its magnificent florets, pleasantly aromatic nature with long shelf life, and white waxy flowers are valued in the horticulture sector and have a high demand in the local market. In the present investigation, the sensory evaluation study was conducted to identify the best fragrant collection of tuberose from different fourteen varieties of single-type tuberose at ICAR-DFR, Pune. Overall sensory evaluation depicted that var. Bidhan Snigdha is the best performed in colour, petal encouragement, and overall acceptability, whereas var. Prajwal graded more in the case of size and shape parameters. Therefore, the present study revealed that the var. Shringar has a higher fragrance compared to other selected varieties, which can be used as a raw material in the perfume-based industries.

Keywords: Tuberose, sensory

Introduction

Sensory testing evaluates genotypes qualitatively in terms of the human senses of sight, smell, taste, and touch. This experimental study aims to incorporate varieties of single-type tuberose for cut, loose, and concrete extraction purposes. Sensory testing is often used to determine consumer acceptability. Evaluators test samples and then rate the products according to the scoring prescriptions provided in the Performa (Lim 2011) [3]. The successful sensory evaluation in food industries is achieved by linking sensory properties to physical, chemical, formulation, and process variables, enabling the manufacturing of food products with maximum consumer acceptance. Imprecisely sensory evaluation is categorized into objective and subjective testing. In the former method, the hedonic response of a product is determined by skilled evaluators whereas, in the second method, consumers are involved in the evaluation process (Sharif *et al.*, 2017) [4]. Flower production is one of agriculture's fastest developing crop trends in agriculture and India's 'flower power' continues to evolve making the country the second largest flower grower in the world after China (Senthil, 2017; Sundar, 2016) [7, 8]. Flower fragrance can be evaluated using sensory analysis, which is based on the perception of our olfactory/sensory system and is frequently employed to determine customer preferences (Natta *et al.*, 2021) [5]. This evaluation will help to prepare the documentary of best-growing tuberose variety collections as a result farmers and breeders from this region can easily identify and grow this species. Due to the pleasant aroma, colour of florets, shape, freshness for shelf life, and size of florets this identified collection can be exported to the perfume industry by the farmers of this region.

Material and Methods

The present experiment was conducted at the Directorate of Floricultural Research, ICAR, farm, laboratory, Keshavnagar, Pune, Maharashtra, in 2021. The experiment was carried out with fourteen single type cultivars viz., Mexican Single, Sikkim Selection, Arka Sugandhi Pune Local Single, Variegated Local Single, Prajwal, Phule Rajani, Shringar, Bidhan Ujjwal, Bidhan Snigdha, Hyderabad Single, Arka Nirantara, GKTC-4 and STR- 501. Fifteen panellists were selected on the basis of their ability to discriminate and scale a broad range of different attributes. The judges randomly tested the colour, shape, size, fragrance, freshness, floret retention, arrangement of florets and average acceptability on the basis of a 0-5 scale which represents; Neither dislike nor like: 0-1, Like slightly: 1.1-2, like moderately: 2.1-3, like very much: 3.1-4, like extremely: 4.1-5. All the cultivars used in the evaluation were given uniform cultural practices and the judges were provided with prescribed questionnaires to record their observation.

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Sensory Evaluation

The tuberose spikes were harvested during the morning from the experiment field. Fifteen people of the institute (10 men and 5 women) who are known about tuberose were randomly selected and the spikes of different tuberose varieties were passed to them and provided with a sensory evaluation form with a structure scale ranging from neither dislike or like to like extremely using 5 hedonic rating scale (Table no.1) and assessed for its organoleptic qualities like colour, shape, fragrance freshness, petal encouragement, Arrangement of florets, Overall acceptability of tuberose varieties. The 5 points scale used for the score where 0= neither like nor dislike and 5= like extremely.

Results and Discussion

The hedonic scale for organoleptic qualities like colour, shape, fragrance freshness, petal encouragement, Arrangement of florets, and Overall acceptability of the tuberose flowers have been calculated and the average mean is displayed in (Table 1).

Among the fourteen varieties evaluated (Table. 1) the highest average scores for flower colour (3.9), petal encouragement (4.1) and overall acceptability (4.63) were recorded in var. Bidhan Snigdha. Shape and size were rated superior in var. Prajwal (4.20 and 4.32 respectively). The minimum scoring of 2.75 and 2.52 was recorded by var. Variegated Local Single and Mexican Single for shape and size of flowers respectively, whereas, var. Mexican Single was graded as inferior (2.41) with respect to colour of the flower. The fragrance and freshness were rated highest in var. Shringar and Bidhan Ujjwal respectively with an average rating of 3.92 and 4.12 respectively. Whereas the fragrance and freshness were rated the least in Pune Local Single (2.75 and 2.41 respectively). Arrangement of petals were rated highest in var. Bidhan Ujjwal with a rating of 4.39 out of five. Further, petal encouragement was recorded the least scoring (3.32) in var. Pune Local Single. The study of mean of all parameters var. Bidhan Snigdha was graded as like very much (4.03) by the respondents and Pune Local Single was graded as like moderately (2.32).

Table 1: Quality attributes of single type tuberose cultivars based on sensory evaluation

Variety	Colour	Shape	Size	Fragrance	Freshness	Petal Encouragement	Arrangement of florets	Overall acceptability	Mean
Mexican single	2.72	3.03	2.52	2.84	3.1	3.49	3.57	3.5	3.10
Shringar	3.2	3.2	3.63	3.92	3.21	3.58	3.49	4.12	3.54
Arka Nirantara	3.6	3.82	3.94	3.43	3.82	3.91	3.51	3.97	3.75
Phule Rajani	3.71	3.7	3.91	3.41	3.83	3.8	3.89	4.63	3.86
Bidhan Snigdha	3.90	4.1	4.23	3.84	4.1	4.13	4.13	4.21	4.08
Hyderabad Single	3.1	3.32	3.11	3.14	3.51	3.7	3.42	3.40	3.34
Variegated Local	3.23	2.5	2.61	2.82	2.93	3.3	3.19	2.97	2.94
Prajwal	3.73	4.2	4.32	3.67	4.10	3.91	3.98	4.31	4.03
GKTC-4	3.4	3.28	3.42	3.31	3.65	3.42	3.91	3.76	3.52
Pune Local Single	2.38	2.8	2.72	2.74	2.41	3.16	2.59	2.32	2.64
Bidhan Ujjwal	3.76	3.96	3.96	3.62	4.12	3.92	4.39	3.87	3.95
Sikkim Selection	3.13	3.12	2.71	3.1	3.1	3.32	3.23	3.12	3.10
STR-501	3.1	3.24	3.21	3.32	3.32	3.56	3.52	3.62	3.36
Arka Sugandhi	3.02	3.41	2.91	3.6	3.61	3.34	3.51	3.56	3.37

Neither dislike nor like: 0-1 Like slightly: 1.1-2 like moderately: 2.1-3 like very much: 3.1-4 like extremely: 4.1-5

Conclusion

The sensory evaluation of tuberose flowers will help farmers to refer the good fragrant variety for commercial cultivation and it will encourage and help them to supply their flower samples as raw material to perfume-based industries in other parts of India, as a result, this approach may lead to improve their financial status and livelihood.

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