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Varietal evaluation of Pak Choi (*Brassica rapa* subsp. *Chinensis*) under poly-house condition

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Abstract

An experiment was carried out in the Department of Horticulture's, polyhouse, SHUATS, Prayagraj during the year 2021. The experiment was laid out in Randomized Block Design comprising of 7 varieties with three replications. The study revealed that Pak Choi White and Pak Choi Emerald Green was recorded with minimum days to germination (3 days), Maximum plant height in Pak Choi White (19.47), Maximum number of leaves in Baby Pak Choi (4.27), Maximum leaf length in Pak Choi White (15.43 cm), Maximum leaf width in Pak Choi White (7.1 cm), Maximum leaf Area in Pak Choi White (120 cm²), Minimum days to harvest in Pak Choi White (78.67 days), Maximum plant weight in Pak Choi White (31.4 g) and Maximum yield per plot and yield (q/ha) in Pak Choi White (3.9 kg) and (128.6q/ha respectively).

Keywords: Pak Choi, growth, and yield

Introduction

Pak Choi (*Brassica rapa* subsp. *Chinensis*) is an important leafy vegetable crop, belonging to the family Brassicaceae. It is eaten as raw, cooked or stir-fried. It is excellent for Salad making, when the plants are young. Pak Choi's are low in fat and cholesterol. Pak Choi leaves have sweet taste and crisp and juicy texture which contains 2.18 g of carbohydrates, 1.5 g proteins and 1.0 g dietary fibre in 100 g of fresh matter (Eşiyok *et al.*, 2011) [6]. A protected vegetable production system is covered by glass or plastic materials, creating a closed or semi-closed environment. Protected vegetable cultivation releases vegetable production from constraints of climatic conditions, allowing all year-round production. Pak Choi needs sufficient amount of water to develop good texture, taste and to prevent the leaves from tip burn. Pak Choi should be watered on regular basis. The minimum soil pH is 6.0-7.5. Pak Choi seeds can be sown directly or transplanted. This annual vegetable has optimal growth and development at temperatures between 15 and 20 °C (Echer *et al.*, 2015) [5]. It is very important to assess also yield quality, mainly the content of bioactive components in the plants. Both term of cultivation (Acikgoz and Altintas, 2011; Kobryń, 2001; Siomos, 1999) [1] and cultivar (Artemyeva *et al.*, 2006) [2] affects biological value of vegetables. Uttar Pradesh has a suitable climate for growing Pak Choi but Pak Choi in general is not a common vegetable which is grown in Uttar Pradesh. Hence, the present investigation was carried out to study the varietal evaluation of Pak Choi genotypes for its Growth and yield parameters.

Materials and Methods

The experiment was laid out in Randomized Block Design comprising of 7 varieties with three replications. The varieties in each replication were allotted randomly. Seeds were sown at a distance of 10×15 cm in the plot of 1 sq. m. 5 plants were selected randomly from each variety from every replication. Data were analysed by using ANOVA suggested by Panse and Sukhatame (1985). The data's recorded were Days to germination, plant height (cm), number of leaves, leaf length (cm), leaf width (cm), leaf area (cm²), Days to harvest, Plant weight (g), yield per plot (kg) and yield (q/ha) of Pak Choi.

Results and Discussion

Data recorded of growth parameters like days to germination, Plant height, number of leaves, leaf length, leaf width and leaf Area of different varieties differed significantly at different growth stages which are presented in (table 1). The minimum days for germination (3 days) was observed in T₅ (Baby Pak Choi) and T₇ (Pak Choi White) followed by T₂ (Hong Tae) (3.3 days). Whereas, the variety T₄ (Canton Milky Dwarf) took (3.6 days) for germination.

The maximum plant height (19.47 cm) was recorded in T₇ (Pak Choi White) followed by T₂ (Hong Tae) (17.8 cm), T₄ (Canton Milky Dwarf) (17.6 cm). Whereas, the minimum plant height (13.27 cm) was found in T₅ (Baby Pak Choi). Similar variation to plant growth were also observed by Meena *et al.*, (2014) [13], Ansari *et al.*, (2018), Suhaida *et al.*, (2021) [9], Tripathi *et al.*, (2015) [8]. The maximum number of leaves (4.27) was recorded in T₅ (Baby Pak Choi), followed by T₁ (Tai Sai) (4.13) and T₆ (Pak Choi Emerald Green) (4.1). Whereas, the minimum number of leaves was found in T₃ (Green Imported Oriental) (3.43 respectively), variations among varieties with respect to number of leaves were reported by several workers, Cho *et al.*, (2007) [4], Purbajanti *et al.*, (2020) [12], Suhaida *et al.*, (2021) [9], Tripathi *et al.*, (2015) [8]. The maximum leaf length (15.43cm) was recorded

in T₇ (Pak Choi White) followed by T₄ (Canton Milky Dwarf) (14.43 cm). Whereas, the minimum leaf length was found in T₅ (Baby Pak Choi) (7.87cm), these variations are closely related to that of Funda (2016) [7], Suhaida *et al.*, (2021) [9]. The maximum leaf width (7.1 cm) was recorded in T₇ (Pak Choi White). Whereas, the minimum leaf width was found in T₅ (Baby Pak Choi) (4.43 cm), these finding are closely related to that of Funda (2016) [7]. The maximum leaf area (120 cm²) was recorded in T₇ (Pak Choi White) followed by T₃ (Green imported oriental) (118 cm²). Whereas the minimum leaf area was found in T₅ (Baby Pak Choi) (82.6 cm²) There are several reports indicating variation with respect to leaf area by several workers, Funda (2016) [7], Cho *et al.*, (2007) [4], Purbajanti *et al.* (2020) [12] and Ansari *et al.*, (2018), Puerta *et al.*, (2020) [11].

Table 1: Growth parameters of Pak Choi like Days to germination, plant height (cm), Number of leaves, Leaf Length (cm), Leaf Width (cm) and leaf Area (cm²)

Varieties	Days to germination	Plant height (cm)	Number of leaves	Leaf length (cm)	Leaf width (cm)	Leaf area (cm ²)
T ₁ - Tai Sai	3.7	16.83	4.13	12.89	5.77	91
T ₂ - Hong Tae	3.3	17.83	3.67	14	5.73	90
T ₃ - Green imported oriental	3.5	15.27	3.43	9.07	5.97	118
T ₄ - Canton Milky Dwarf	3.6	17.6	4	14.43	5.4	103
T ₅ - Baby Pak Choi	3.5	13.27	4.27	7.87	4.43	82.6
T ₆ - Pak Choi Emerald Green	3.0	17.43	4.11	12.33	6.7	115.6
T ₇ - Pak Choi White	3.0	19.47	3.73	15.43	7.1	120
F-Test	S	S	S	S	S	S
S.Ed. (±)	0.64	0.96	0.20	2.30	0.55	4.80
C.D at 5%	0.45	2.09	0.43	5.02	1.19	10.46

Table 2. Shows the maximum number of days taken for maturity (82 days) which was found in T₄ (Canton Milky Dwarf). Whereas, minimum days to harvest was found in T₇ (Pak Choi White) (78.67 days). The maximum plant weight was found in T₇ (Pak Choi White) (31.4g) followed by T₃ (Green Imported Oriental) (30.5g). Whereas, minimum plant weight was found in T₅ (Baby Pak Choi) (23g). The maximum yield per plot (3.9 kg) was obtained in T₇ (Pak

Choi White) followed by T₃ (Green imported oriental) (3.82kg). Whereas, the minimum yield per plot was found in T₅ (Baby Pak Choi) (2.8 kg). The maximum yield per ha (128.6 q) was obtained in T₇ (Pak Choi White) followed by T₃ (Green imported oriental) (127.6 q). Whereas, the minimum yield (q/ha) was found in T₅ (Baby Pak Choi) (94.5 q).

Table 2: Yield parameters of Pak Choi like Days to harvest, Plant Weight (g), Yield per plot (kg), Yield (q/ha)

Varieties	Days to harvest	Plant weight (g)	Yield per plot (kg)	Yield (q/ha)
T ₁ - Tai Sai	80	25.5	2.9	95.8
T ₂ - Hong Tae	80.67	25.9	3.2	106.5
T ₃ - Green imported oriental	81	30.5	3.82	127.6
T ₄ - Canton Milky Dwarf	82	25.8	2.97	99.1
T ₅ - Baby Pak Choi	79.33	23	2.8	94.5
T ₆ - Pak Choi Emerald Green	80.33	26.9	3.4	112.8
T ₇ - Pak Choi White	78.67	31.4	3.9	128.6
F-Test	S	S	S	S
S.Ed. (±)	0.80	2.26	0.27	8.67
C.D at 5%	1.74	4.93	0.58	18.88

Conclusion

On the basis of present investigation, it is concluded that the variety T₇ (Pak Choi White) was found to be the most suitable over all the other variety in relation to growth and yield of Pak Choi.

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