Original Research Article

PERFORMANCE OF DIFFERENT VARIETIES OF BOUGAINVILLIEA (*Bougainvillea glabra*) PROPAGATED THGROUGH HARD WOOD CUTTINGS UNDER PRAYAGRAJ SHADENET HOUSE CONDITIONS

ABSTRACT

An experiment to ascertain the performance of different varieties of bougainvillea (*Bougainvillea glabra*) propagated through hardwood cuttings under 50% shadenet house conditions in Prayagraj, was carried out during February, 2022 to July, 2022, in the Department of Horticulture, SHUATS, Prayagraj. The experiment was laid out in Completely Randomized Design (CRD), with fourteen different bougainvillea varieties, replicated thrice. Among the different varieties of bougainvillea, variety Isbel Green Smith recorded minimum days taken to 1st sprouting (10 days) and days taken to 50% sprouting (10.3 days), variety Joe de Libra recorded maximum sprouting percentage (96.7%) and success rate (96.7%). Length of 1st shoot/cutting (3.8 cm) and number of leaves/cutting (58.9) were recorded in variety Shubra, whereas, variety Chandraberi recorded maximum girth of 1st branch (4.4 cm).

Key words: *Bougainvillea, Cuttings, Hardwood, Propagated, Varieties*

INTRODUCTION

Bougainvillea is termed as "Glory of the Tropics" due to its high popularity and intense use in the tropical countries. It belongs to the family Nyctaginaceae, which is native to tropical and sub-tropical regions of South America **(Singh *et al*., 2016).** It is popular among parks, home and institutional gardens grown mainly as bush, climber, hedge, topiary, standard, pot plant, bonsai, on pergolas and trees **(Roy, 1987; Sharma and Roy, 2001).** It is found from Brazil, west to Peru and south to southern Argentina. Wide adaptability to different agro-climatic conditions and easy multiplication has made it a popular ornamental plant of the world **(Priyadarshi *et al.*, 2017).** Moreover, as it is a drought and pollution resistant plant, it is well suited for industrial places and on road dividers. **(Salam *et al*., 2017).**

The name Bougainvillea comes from Louis Antoine de Bougainville, a French navigator and military commander who was the first European to take note of the plant, in Brazil, in 1768. *Bougainvillea spectabilis* was the first to be introduced in India from Europe in 1860 followed by *B.*

glabra cv. 'Splendens' (1969), *B. x buttiana* cv. 'Scarlet Queen' (1920) and 'Mrs. Butt' (1923) and *B. peruviana* cv. 'Princes Margaret Rose' in 1935 **(Datta 2021).** Such floriferousness is highly regarded not only for landscape plants but also for small container-grown plants sold by florists and nurserymen to decorate indoor and outdoor living areas. **(Sharma *et al*., 2020).**

India is one of the major repositories of a wide range of bougainvilleas, and approxi mately 50 % of the present-day cultivars have been evolved in India **(Janakiram *et al*., 2013).** The work on development of Bougainvillea has largely been done by the Agri-Horticultural Societies at Calcutta and Madras. The Lal Bagh Garden at Bangalore also contributed a great deal by introducing a large number of exotic cultivars, particularly the multi-bracted varieties from the Philippines. Different br eeding approaches followed in bougainvill ea are hybridization, polyploidy, mutation and bud sports. A large number of varieties have been developed at the NBRI (Lucknow), BARC (Mumbai) and IIHR (Bengaluru).

Bougainvilleas are extensively used as hedges, barriers, slope coverings, ground covers on banks and they are also used as live screens, specimens, for pergolas, bonsai, hanging baskets, pot culture, espaliers and green walls. They can be grown under wide range of climatic conditions but the performance of different variety varies with the region, season and other growing conditions. So, it is necessary to identify the most suitable variety for a particular region. A new plant grown from a stem cutting will mature faster and will bloom sooner than a plant grown from a seed or root cuttings. Thus, a field trail on Performance of different varieties of bougainvillea (*Bougainvillea glabra)* propagated through hardwood cuttings under Prayagraj shadenet house conditions was conducted to assess success of different bougainvillea varieties propagated through hardwood stem cuttings under Prayagraj agro climatic conditions.

MATERIALS AND METHODS

The experiment was conducted in 2 022 (February to July) in the Department o f Horticulture, Naini Agricultural Institute, Sam Higginbottom University Agriculture, Technology And Sciences, Prayagraj locate d at 25°39'42''N latitude, 81°67'56''E lon gitude and 98 m altitude above the mean sea level. The experiment was laid out in Completely randomized design (CRD) which consists twenty treatments and were replicated thrice under 50% shadenet conditions. Total fourteen bougainvillea

varieties were used in the experiment namely; Parthasarthy, Joe de Libra, Palekar, Aruna, Isbel Green Smith, Hawain White, Chandraberi, Vishakha, Elizabeth, Filoman, Mrs. R.B. Carrick, Dr. Harbhajan Singh, Shubra and Shweta. All the varieties were procured from National Botanical Research Institute (NBRI), Lucknow. Sand and soil were thoroughly mixed in a ratio of 1:0.5 v/v to make potting mixture which was filled in black poly bag (8inch × 12 inch). Hardwood cuttings were dipped in IBA solution of 4000 ppm for 24 hours and then were planted in poly bags (one cutting in one bag) filled with the potting mixture. The recorded data of various parameters was statistically analyzed following the standard analysis of variance (ANOVA) technique.

RESULTS AND DISCUSSION

PROPAGATED PARAMETERS

Days taken to 1st sprouting - Among all the varieties, significantly lesser days were taken for 1st sprouting by variety Isbel Green Smith (10 days) which was found to be at par with variety Shubra (11 days) while, more no. of days were taken to 1st sprouting was observed in the variety Palekar (22 days).

Days taken to 50% sprouting of different bougainvillea varieties - Among all the varieties, significantly lesser no. of days were taken for 50% sprouting by variety Isbel Green Smith (10.3 days) which was found to be at par with variety Shubra (12.0 days) while, more no. of days taken to 50% sprouting was observed in the variety Palekar (26.7 days). Variation in days taken to 1st sprouting and 50 percentage sprouting might be influenced by the parental genotypes, their genetic makeup and growth behaviour in the prevailing climatic conditions.

Sprouting percentage of different bougainvillea varieties - Among all the varieties, significantly higher sprouting percentage was observed in the variety Joe de Libra (96.7%) which was found to be at par with Chandraberi (93.3%), Vishakha (93.3%), Dr. Harbhajan Singh (93.3%), Shubra (86.7%), Isbel Green Smith (83.3%), Mrs. R.B. Carrick (83.3%), Palekar (80%) and Elizabeth (80%) while, lower sprouting percentage was observed in the variety Filoman (53.3%)**.** Variation in sprouting percentage of cuttings might be due to genetic makeup of different varieties responsible for plant vigour and environmental effect. Similar results were recorded in gladiolus by **Nalage *et al*. (2019).**

Length of 1st shoot (cm) of different bougainvillea varieties - Among all the varieties, longer 1st shoot (cm) of cutting

was recorded in the variety Shubra (87.0 cm) which was significantly more than any other variety followed by Parthasarthy (69.2 cm) while, shorter 1st shoot (cm) was observed in the variety Vishakha (31.4 cm). Variation in length of shoot being a genetically controlled factor, varied among the different varieties due to their different genetic makeup and environmental effects.

Number of leaves per cutting of different bougainvillea varieties - Among all the varieties, more no of leaves was recorded in the variety Shubra (58.9) which was significantly superior over all the varieties followed by Joe de Libra (52.6) while, less no of leaves was observed in the variety Vishakha (31.1). The variance in the vegetative development across genotypes, which is caused by genetic make-up and may also have been influenced by agro climatic circumstances, is what causes the variation in the number of leaves per cutting. Similar results were reported by **Sharma *et al*. (2018)** in Lilium.

Girth of 1st branch (cm) per cutting of different bougainvillea varieties - Among all the varieties, significantly more girth of 1st branch (cm) was recorded in the variety Chandraberi (5.0 cm) which was superior over all the varieties followed by Aruna (4.5 cm) while, less girth of 1st branch (cm) was observed in the variety Dr. Harbhajan Singh (2.0 cm)**.** Variation in girth of branch of bougainvillea varieties might be due to the varietal character which varies from variety to variety and the morphological traits and adaptability of the variety to the prevailing climatic conditions.

Success rate of cuttings of different varieties of bougainvillea - Among all the varieties, significantly higher success rate of cuttings was observed in the variety Joe de Libra (96.7%) which was found to be at par with Chandraberi (93.3%), Vishakha (93.3%), Dr. Harbhajan Singh (93.3%), Shubra (86.7%), Isbel Green Smith (83.3%), Mrs. R.B. Carrick (83.3%), Palekar (80%) and Elizabeth (80%) while, lower success rate was observed in the variety Filoman (53.3%). Variation in success rate of cuttings might be due to the adaptability of different varieties in the given environmental conditions.

CONCLUSION

From the present investigation it is concluded that fourteen varieties of bougainvillea under the study showed significant variation in all the parameters studied. Early sprouting and 50% sprouting was recorded in variety Isbel Green Smith, variety Joe de Libra had highest sprouting percentage and success rate. Longest shoot and number of

leaves/cutting was recorded in variety Shubra, whereas, variety Chandraberi had maximum girth.

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Table1: Performance of Different Varieties of Bougainvilliea.

NOTATION	VARIETY	Days taken to 1st sprouting	Days taken to 50% sprouting	Sprouting percentage	Length of 1st shoot (cm)	No of leaves	Girth of 1st branch (cm)	Success rate
V1	Parthasarthy	12	13.3	70.0	69.2	40.4	4.0	70.0
V2	Joe de Libra	12	13.7	96.7	50.9	52.6	3.9	96.7
V3	Palekar	22	26.7	80.0	44.3	37.7	3.0	80.0
V4	Aruna	12	13.3	70.0	39.2	37.2	4.5	70.0
V5	Isabel Green Smith	10	10.3	83.3	48.8	39.5	3.5	83.3
V6	Hawain White	12	13.3	60.0	42.0	46.6	2.5	60.0
V7	Chandraberi	12	13.0	93.3	58.7	49.8	5.0	93.3
V8	Vishakha	13	13.7	93.3	31.4	31.1	2.2	93.3
V9	Elizabeth	12	14.3	80.0	44.8	41.9	2.7	80.0
V10	Filoman	12	13.0	53.3	41.2	38.3	3.2	53.3
V11	Mrs. R.B. Carrick	15	16.0	83.3	45.3	43.4	2.8	83.3
V12	Dr. Harbhajan Singh	14	15.0	93.3	35.6	51.2	2.0	93.3
V13	Shubra	11	12.0	86.7	87.0	58.9	4.4	86.7
V14	Shweta	15	16.0	63.3	45.8	36.2	3.6	63.3
F-TEST		**S**	**S**	**S**	**S**	**S**	**S**	**S**
SE.d (±)		1.23	1.61	12.91	3.39	1.20	0.11	12.91
$CD_{0.05}$		1.82	2.38	19.07	5.01	1.77	0.16	19.07
CV		11.50	0.97	20.00	8.50	3.41	4.04	20.00