www.ThePharmaJournal.com

The Pharma Innovation

**ISSN (E): 2277-7695**
**ISSN (P): 2349-8242**
**NAAS Rating: 5.23**
TPI 2023; 12(5): 927-930
© 2023 TPI
www.thepharmajournal.com
Received: 10-03-2023
Accepted: 13-04-2023

**Shashi Kiran Minj**
Department of Floriculture and landscape Architecture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

**Pooja Gupta**
Assistant Professor, Department of Floriculture and Landscape Architecture, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

**Rajnish Kumar Sahu**
Department of Fruit Science, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

**Madhavi Khilari**
Department of Floriculture and Landscape Architecture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

**Corresponding Author:**
**Shashi Kiran Minj**
Department of Floriculture and Landscape Architecture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

# Standardization of media for propagation of Bougainvillea (*Bougainvillea* comm. Ex Juss.)

**Shashi Kiran Minj, Pooja Gupta, Rajnish Kumar Sahu and Madhavi Khilari**

**Abstract**
The present experiment entitled "Standardization of media for propagation of Bougainvillea (*Bougainvillea* comm. Ex Juss.)" was carried out at Horticultural nursery, College of Agriculture, IGKV, Raipur, (C.G) during the year 2019-20 and the experiment was conducted in Completely Randomized Design (CRD) with 16 treatments and 5 replications comprising of soilless media and biofertilizer Azotobacter. All the media treatments studied recorded superior vegetative and rooting attributes over control. Among the media treatments studied soil + sand + cocopeat recorded maximum sprouting percentage and survival percentage. All other vegetative attributes viz. number of sprouts (3.60), sprouting percentage (72%), number of plants established (22), highest number of branches at (4.80), maximum number of leaves (80.0), highest shoot length at (74.00 cm), the highest value for Plant height (78.80 cm) found optimistic in media containing cocopeat with soil and sand. The findings revealed that all increasing media treatments had a significant effect on all characters relevant to shoot and root growth and also the development of Bougainvillea. The findings revealed that all the characters linked to shoot and root growth were greatly affected by all the growing media treatments and also the development of Bougainvillea. The maximum overall production cost has been seen in T6 (Soil + Sand + Cocopeat) and the least production cost in T13 (Soil + Azotobacter). Combination of rooting media has been beneficial to significantly increase the vegetative growth parameters and economics as compared to control in Bougainvillea.

**Keywords:** *Azotobacter*, cocopeat, Bougainvillea

## Introduction
Bougainvillea is a very attractive and an important ornamental flowering shrub, which is grown for its brightly coloured bracts over a wide range of climate across the world. It is an evergreen shrubby vine of tropical and sub- tropical regions of the whole world. Due to high popularity and extensive use in gardening, Bougainvillea is known to be „Glory of the tropics" in Tropical countries. The place of origin is Rio De Jenerio, Brazil. It imparts beauty to gardens. Belonging to the family Nyctaginaceae, it has ten species, but only 3 species *B. spectabilis, B. glabra* and *B. peruviana* are of horticultural. It is mainly grown in open field condition.

In C.G, bougainvillea is gaining popularity as it is a pollution tolerant shrub and can be planted in extreme temperature and harsh climate where other ornamental plants failed to perform, and produce flower abundantly. They are the most suitable plant and no other plant can influence the landscape and garden in such an incredible way. It has been recommended to absorb pollutants and other harmful greenhouse gases in the environment and also in places of heavy industries (Kulshreshtha *et al.* 2009) [5].

Use of different types of rooting media having different characteristics is important for quality rooting in cuttings. Though there is no universal rooting mix, different medias are used according to cutting types, different seasons etc (Singh, 2018) [2]. Eed *et al*. (2014) [3] conducted an experiment on *Simmondsia chinensis* by using different media like soil, soil + sand, soil + peat moss. Good rooting media with proper aeration and higher water holding capacity can be suggested for higher root formation. Growing media is an essential material for the production of high quality plants grown in containers. Higher root formation can be attributed to greater water holding capacity and good rooting media aeration. Aeration is in general used for root production. A variety of light weight products are present in the market and are being increasingly introduced to the trade such as sand, peat moss, perlite, vermiculite, vermicompost, and FYM.

Properties of good soilless growth media should have high porosity, stability of organic matter, good water holding capacity, must retain sufficient moisture, aeration, optimum pH (5.0-6.5) and EC (0.6 dms/cm2) for polybag plants (Gohil *et al*. 2018) [4].

## Materials and Methods

The field experiment was performed during the year 2019-2020 at the Horticulture research cum Instructional Farm, College of Agriculture, IGKV, Raipur (C.G).

**Table 1:** Treatment Details

| S.no | Treatments | Treatment details |
|---|---|---|
| 1. | $T_1$ | Sand |
| 2. | $T_2$ | Cocopeat |
| 3. | $T_3$ | Rice husk |
| 4. | $T_4$ | Sawdust |
| 5. | $T_5$ | Soil + FYM + Sawdust |
| 6. | $T_6$ | Soil + Sand + Cocopeat |
| 7. | $T_7$ | Sand + FYM |
| 8. | $T_8$ | Sand + Azotobacter |
| 9. | $T_9$ | Soil + Cocopeat |
| 10. | $T_{10}$ | Soil + Sand + Ricehusk |
| 11. | $T_{11}$ | Soil + Sand |
| 12. | $T_{12}$ | Cocopeat + Azotobacter |
| 13. | $T_{13}$ | Soil + Azotobacter |
| 14. | $T_{14}$ | Ricehusk + Azotobacter |
| 15. | $T_{15}$ | Sawdust + Azotobacter |
| 16. | $T_{16}$ | Soil (control) |

After cutting from the mother plants, the hardwood cuttings (10-15 cm) of pencil thickness were prepared. The leaves were carefully trimmed from the shoots to prevent damage to the axiliary buds. The cuttings were prepared to differentiate both ends during planting by giving a slanting cut on the upper end and a straight cut on the lower end. The cuttings were planted immediately in media mixtures after quick dip treatment of IBA@ 4000 ppm for (<5 sec.) directly in the polythene bags.

1g of IBA was first dissolved in a few drops of 0.1N NaOH for 4000 ppm of IBA solution and then up to 250 ml of distilled water was make up in order to achieve the right concentration of IBA.

In the polybags with pre-punched bottom holes for drainage, various treatments containing different media were filled in. Various intercultural operations were carried out when needed. Various shoot and root attributes were noted and Statistically evaluated using Annova for Completely Randomized Design (CRD).

## Result and Discussion

The current observational data was statistically analysed using Anova. Highest number of sprouts per cutting (3.60) was noticed in T6 (Soil + Sand + Cocopeat). It may be due to the auxin application, that enhanced histological traits such as callus tissue formation and vascular tissue differentiation. Sprouting in the cuttings used for sprouting was often due to the accumulated carbohydrates. The number of shoots per cutting was more observed with the IBA and NAA treated cutting and could be due to auxin and its appropriate concentration which improves callus and tissue formation and differentiation of vascular tissue (Mitra and Bose, 1954) [6].

The maximal sprouting percentage (72%) was noted in T6 (Soil + Sand + Cocopeat). At 90 DAP, the maximum number of plants established (22) was observed in T6 (Soil + Sand + Cocopeat), similar findings were noticed by Singh (2020) [8] in Bougainvillea.

The highest number of branches at 150 DAP (4.80) was recorded with T6 (Soil + Sand + Cocopeat). This can be due to their combination, which provided nutrient efficiently to the plants causing stimulation of auxiliary buds thus increasing number of branches per cutting. The highest shoot length at 150 DAP (74.00 cm) was recorded with T6 (Soil + Sand + Cocopeat).Similar results were reported by Sahariya *et al*. (2013) [9] in Bougainvillea.

Likewise, 150 DAP, The maximum number of leaves (80.0) was observed with T6 (Soil + Sand + Cocopeat) and at 150 DAP, the highest value for Plant height (78.80 cm) was recorded with T6 (Soil + Sand + Cocopeat). Plant height was significantly influenced by growing media throughout the experimental period. Significant effect of growing media is related to the retention of optimum moisture, good aeration in the root zone as evident from highest porosity in media. Similar results were noted by Anuje *et al*. (2004) [1] in gerbera.

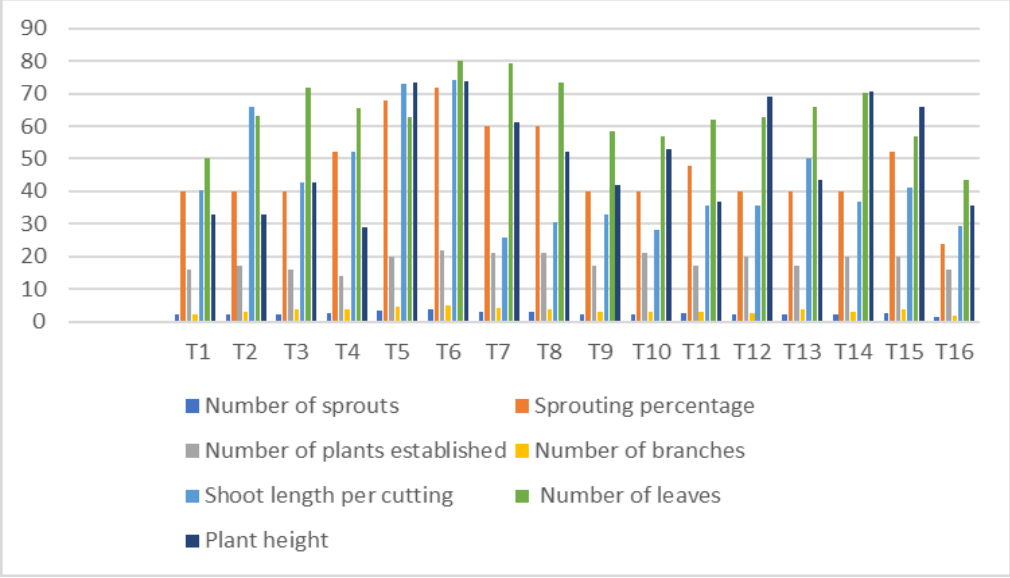


**Fig 1:** Graphical representation of effect of growing media on Bougainvillea

**Table 2:** Effect of growing media on Bougainvillea

| Tr. No. | Treatments | Number of sprouts | Sprouting percentage | Number of plants established |
|---|---|---|---|---|
| | | 30 DAP | 30 DAP | 90 DAP |
| T1 | Sand | 2.0 | 40 | 16 |
| T2 | Cocopeat | 2.0 | 40 | 17 |
| T3 | Ricehusk | 2.0 | 40 | 16 |
| T4 | Sawdust | 2.6 | 52 | 14 |
| T5 | Soil + FYM + Sawdust | 3.4 | 68 | 20 |
| T6 | Soil + Sand + Cocopeat | 3.6 | 72 | 22 |
| T7 | Sand + FYM | 3.0 | 60 | 21 |
| T8 | Sand + *Azotobacter* | 3.0 | 60 | 21 |
| T9 | Soil + Cocopeat | 2.0 | 40 | 17 |
| T10 | Soil + Sand + Ricehusk | 2.0 | 40 | 21 |
| T11 | Soil + Sand | 2.4 | 48 | 17 |
| T12 | Cocopeat + *Azotobacter* | 2.0 | 40 | 20 |
| T13 | Soil + *Azotobacter* | 2.0 | 40 | 17 |
| T14 | Ricehusk + *Azotobacter* | 2.0 | 40 | 20 |
| T15 | Sawdust + *Azotobacter* | 2.6 | 52 | 20 |
| T16 | Soil (control) | 1.2 | 24 | 16 |
| | SEm ± | 0.16 | 0.17 | 0.33 |
| | C.D @ 5% | 0.46 | 0.47 | 0.94 |

**Table 2.1:** Effect of growing media on Bougainvillea

| Tr. No. | Treatments | Number of branches | Shoot length per cutting | Number of leaves | Plant height |
|---|---|---|---|---|---|
| | | 150 DAP | 150 DAP | 150 DAP | 150 DAP |
| T1 | Sand | 2.00 | 40.40 | 50.00 | 32.82 |
| T2 | Cocopeat | 3.00 | 65.80 | 63.00 | 33.04 |
| T3 | Ricehusk | 3.60 | 42.60 | 72.00 | 42.60 |
| T4 | Sawdust | 3.60 | 52.20 | 65.40 | 29.00 |
| T5 | Soil + FYM + Sawdust | 4.40 | 73.18 | 62.60 | 73.20 |
| T6 | Soil + Sand + Cocopeat | 4.80 | 74.00 | 80.00 | 73.80 |
| T7 | Sand + FYM | 4.00 | 25.60 | 79.40 | 61.20 |
| T8 | Sand + *Azotobacter* | 3.80 | 30.40 | 73.20 | 52.20 |
| T9 | Soil + Cocopeat | 3.00 | 33.02 | 58.60 | 41.98 |
| T10 | Soil + Sand + Ricehusk | 2.80 | 28.20 | 56.80 | 53.04 |
| T11 | Soil + Sand | 3.00 | 35.60 | 62.00 | 36.62 |
| T12 | Cocopeat + *Azotobacter* | 2.40 | 35.60 | 62.60 | 69.18 |
| T13 | Soil + *Azotobacter* | 3.60 | 50.20 | 66.00 | 43.60 |
| T14 | Ricehusk + *Azotobacter* | 2.80 | 36.60 | 70.20 | 70.60 |
| T15 | Sawdust + *Azotobacter* | 3.60 | 41.22 | 57.00 | 66.00 |
| T16 | Soil (control) | 1.80 | 29.18 | 43.60 | 35.58 |
| | SEm ± | 0.18 | 1.28 | 3.95 | 1.60 |
| | C.D @ 5% | 0.52 | 3.63 | 11.16 | 4.53 |

## Conclusion

Cocopeat can be reused for upto 4 years It is durable, light weighted and resistant to fungi and bacteria, which is essential for healthy root growth. Although cocopeat is low in nitrogen, calcium and magnesium but it is high in phosphorus and potassium (Gohil *et al*. 2018) [4]. Benefits of phosphorus in plants is that, it is good for the root growth and development. Therefore, it can be concluded that the media containing (Soil + Sand + Cocopeat) showed better growth and is advantageous than all treatments. Considering its huge demand, hardwood cutting propagation would be inevitable for commercial production of Bougainvillea for nurserymen on small scale.

## Reference


1. Anuje, AA, Dalal SR, Gonge VS, Deshpande RM. Effect of growing media on growth, flowering and yield of gerbera under polyhouse conditions. Orissa Journal of Horticulture. 2004;32(2):106-108.
2. Carlson MC. Microchemical studies of rooting and non-rooting rose cuttings. Bot. Gaz. 1929;87(1):64.
3. Eed A, Burgoyne A. Effect of different rooting media and plant growth regulators on rooting of jojoba (*Simmondsia chinensis* (Link) Schneider) Semi-hard Wood Cuttings under Plastic Tunnel Conditions. International Conference on Agricultural, Ecological and Medical Sciences. 2014, 6-7.
4. Gohil P, Gohil M, Rajatiya J, Halepotara F, Solanki M, Malam VR, *et al.* Role of growing media for ornamental pot plants. Int. J Pure App. Biosci. 2018;6(1):1219-1224.
5. Kulshreshtha K, Rai A, Mohanty CS, Roy RK, Sharma SC. Particulate pollution mitigating ability of some plant species. International Journal of Environmental Research. 2009;3(1):137-142.
6. Mitra GC, Bose N. Rooting and histological responses of detached leaves to B-Indolebutyric acid with special reference to *Boerhavia diffusa* Linn. Phytomorphology, 1954;7(3/4):370-38.
7. Singh KK. A review: Multiplication of *Bougainvillea species* through cutting. International Journal of Chemical Studies. 2018;6(2):1961-1965.
8. Singh B, Sindhu SS, Yadav H, Saxena NK. Effect of

different potting media on bougainvillea propagation cv. Mahara. Chem Sci Rev Lett. 2020;9(33):158-161.
9. Sahariya K, Singh JN, Singh A. Studies on the effect of IBA on rooting of *Bougainvillea* (var. Thimma) cuttings in open field and polyhouse condition. Asian J Hort. 2013;8(1):140-142.