

## **INFLUENCE OF PLANTING DATE AND MEDIA ON ROOTING OF STEM CUTTINGS OF *Bougainvillea glabra***

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### **ABSTRACT**

This study was carried out in private farm at Al-Kanatier Alkhairyia region during two successive seasons (2008/2009- 2009/2010) to evaluate influence of planting date and media on rooting of stem cuttings of *Bougainvillea glabra*. The results clearly show that, the rooting medium peat moss gave the best significant results in rooting percentage (100%) in both season with cuttings cultured in mid December in both season. Concerning, number and length of root/plant, different planting dates didn't record significant values with the media examined. While peat moss medium recorded the highest significant values comparing with other media in number of root/plant (16.3 and 13.3 ) during 1<sup>st</sup> season and (11.3 and 11.0) during 2<sup>nd</sup> season in February and December ,respectively. in root length cm/ plant (10.5 and 12.33.) during 1<sup>st</sup> season and (10.6 and 10.3 ) during 2<sup>nd</sup> season in February and December respectively. Regarding, shoot length cm/plant, the cuttings planting during December recorded the best results, values that were (30.3 and 31.0 cm/plant) comparing with February, values were (11.0 and 14.0 cm/plant) during 1<sup>st</sup> and 2<sup>nd</sup> season respectively.

### **INTRODUCTION**

*Bougainvillea* (Nyctaginaceae) genus of 14 species of evergreen shrubs, trees and evergreen or partly deciduous , sometimes thorny climbers, from forest and thickets in tropical and subtropical South America. *Bougainvillea* is a well – known climbing plant for landscape use and also for green house cultivation as a pot plant , Christopher (1996) . The importance of the rooting medium for rooting plant cuttings is widely recognized, Atangana *et al.* (2006). There is no universal or ideal rooting medium for cuttings because the requirements depend on the species, type of cutting, season and propagation system, Hartmann *et al.* (2002). Cuttings of many species root successfully in a variety of rooting media, but the rooting performance – in terms of both number of roots and rooting percentage – may be greatly influenced by the type of rooting medium used ,Leakey *et al.* (1990). Peat, the most widely used growing medium, is a non-renewable resource. because of concerns about destruction of peat bogs, Raviv *et al.* (1986) and Handreck (1992). Peat, is used in many different situations as a mulch, substrate and soil structure amendment, for most cropping systems, Lennartsson (1997). Most nurseries in the world have based for many years their growing media on peat , Wilson *et al.* (2006). Sand dunes are the best source due to their physical properties, being medium or the coarse sand particles which provide optimum adjustments in media texture, certainly sand is the least expensive of all inorganic amendments which makes it a valuable amendment for both potting and propagation media ,Wilson and Stoffella (2006). The sand must be amended with native peat from muskeg bogs and

clay overburden to reconstruct soils that will support the growth of plant communities, Fung and Macyk (2000). Peat was mixed with sand to decrease the chance of formation of anaerobic conditions created by microbial decomposition of the organic material, and to optimize hydraulic conditions, Rasmussen *et al.* (2002). The addition of a mineral component such as coarse sand to rooting media is recommended to increase the proportion of large air-filled pores and drainage, Bunt (1988). Sabalka (1986) emphasized that, most propagators use a combination of organic and mineral components, in which peat is traditionally included. Addition of coarse sand and pine bark compost to the composted gorse significantly increased the rooting success, Iglesias-Díaz *et al.* (2009). On the other hand, the prevailing environmental conditions in the nursery i.e. light, temperature and humidity play an important role in rooting and success seeding growth and development stages of cuttings, Karaguzel (1997). This may be related to changes in the endogenous plant growth regulators or carbohydrate conditions, Day and Loveys (1998). Rooting success of cuttings has often been correlated with the temperature of the stock plant environment prior to taking cuttings, although optimum rooting has been associated with specific temperatures, Hansen (1990). Change in temperature may also have an effect (Moe, 1990). However, increased rooting may not be the result of high temperature, higher seasonal temperatures often coincide with increased bud activity, flowering and higher growth, Kibbler *et al.* (2002). Auxin effect on differential rooting with season in *Backhousia citriodora* plant is determined by the physio-morphological status of the branches that govern the production of endogenous auxin and is mediated primarily through its effect on mobilization of reserve food materials caused by enhanced activity of hydrolytic enzymes, Nanda and Anand (2006).

## **MATERIALS AND METHODS**

This investigation was carried out in private Farm at Al-kanatier Alkhairyia region during two successive seasons (2008/2009 - 2009/2010) to evaluate effect of planting date and media on rooting stem cuttings of *Bougainvillea glabra* plant.

### **Plant Materials.**

The cuttings of *B. glabra* plants used in this study were collected from mother plants which are growing in Al-Kanatier Alkhairyia region. All cuttings were immersed for 15 sec. in 5000 ppm IBA +100 ppm NAA + 100 ppm ascorbic acid and cultured under plastic tunnel.

### **The cuttings were treated as following.**

- 1- Effect of planting date on the rooting.  
Cuttings were cultured in two planting dates as follow: during mid of December and February month.
- 2- Effect of planting media on the rooting.  
Cuttings were cultured in plastic pots (8 cm ) diameter full of different media as follow : sand, silt , peat moss and peat moss+ sand (1/1- V/V).

**Measurement and Determinations :**

The following parameters were recorded after 60 days from planting at each growing season as follow : Rooting percentage, Root number, Root length cm and Shoot length cm/ plant.

**The statistical analysis.**

The experiment was conducted under complete randomized design (CRD) with three replications and 9 plants for each replicate (Snedecor and Cochran, 1972 ) and the means were compared using L.S.D. test.

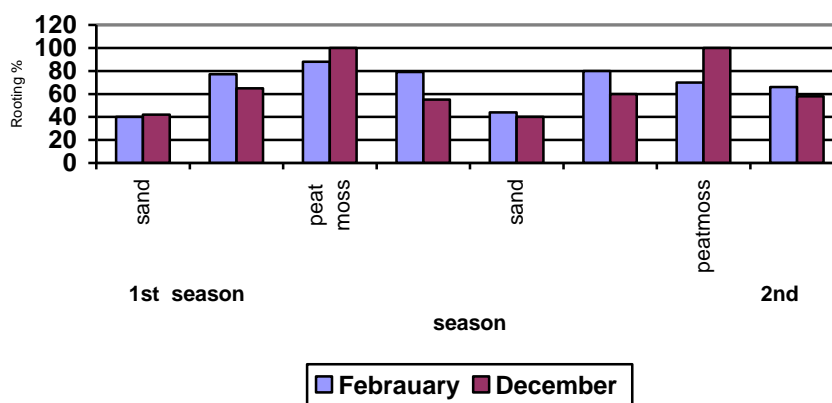
**RESULTS AND DISCUSSION**

**Effect of planting date and media on rooting percentage / plant .**

Data in Table (1) and Fig (1) show that, good positive correlation between rooting percentage and peat moss medium for cuttings cultured in December month.

**Table (1): Effect of planting date and media on rooting of stem cuttings of *Bougainvillea glabra*.**

Treatments		1 <sup>st</sup> season(2008 / 2009)				2 <sup>nd</sup> season (2009/2010 )			
Planting Date	Planting media	Rooting %	Root number /plant	Root length cm /plant	Shoot length cm/ plant	Rooting %	Root number /plant	Root length cm/plant	Shoot length cm/ plant
February	Sand	40	5.6	7.6	5.2	44	6.2	5.6	7.5
	Silt	77	8.3	9.3	5.1	80	9.52	9.8	11.1
	Peat moss	88	16.6	10.5	11	70	11.3	10.6	14.0
	Peat moss+ sand (1/1- V/V )	79	11.2	7.9	9.6	66	8.6	6.3	12.1
December	Sand	42	5.8	5.3	6.3	40	6.0	5.0	9
	Silt	65	8.0	6.2	25	60	8.2	5.3	24
	Peat moss	100	13.6	12.3	30.3	100	11.0	10.3	31.0
	Peat moss+ sand (1/1-V/V)	55	8.5	8.3	20.6	58	9.1	9.3	22.1
<b>L.S.D. at 5%</b>		-	3.32	2.09	4.15	-	2.41	2.1	3.8

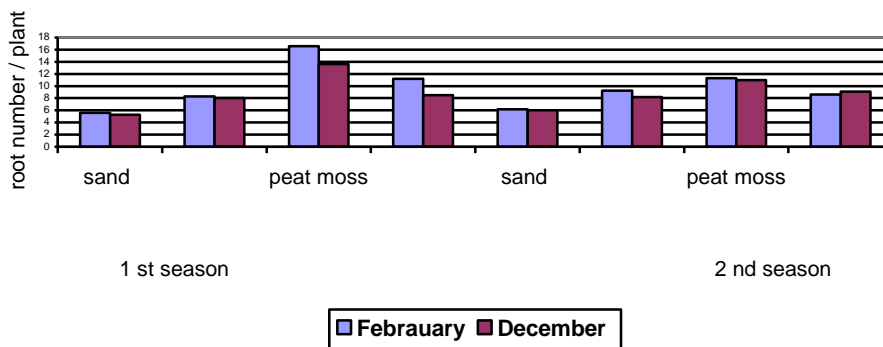


**Fig. (1): Effect of planting date and media on rooting percentage**

Cuttings cultured during December month gave the highest significant values of rooting percentage (100%) in the 1<sup>st</sup> and 2<sup>nd</sup> season using peat moss medium. While the lowest values of rooting percentage / plant (40 % in February month and 42 % in December month ) were recorded under sand medium in the 1<sup>st</sup> season .A similar trend was observed in the second season. In this respect, Rasmussen (1999) observed that, peat moss was chosen as a good candidate medium, and Bailey(1999) emphasized that, Peat was selected because it is inexpensive and easy to use, and is known to be an efficient barrier material for treating waste water . Also, peat efficiently removes benzene, toluene, *m*-xylene, Cohen (1991). And has also shown removal of phenol, Viraraghavan and Alfaro (1998). The stimulant effects on root growth may be attributed to the low temperature and to increase in photosynthetic rate during winter months, which leads to produce more carbohydrate content, Devlin and Witham (1986) . Similar results were obtained by Rowezak (2001) on *Ficus retusa* who recorded that, an increase in root growth during January., which help the initiation of the mechanism needed for the complicated physiological activities between the time of cuttings taking and the roots initiation Rahman *et al.* (1991). Cuttings of both 'Rehovot' and 'Tzfat' land-races of myrtle, when sampled throughout the year, had a significant temporal variation in the percentage of successful rooting. The rooting percentage of cuttings taken during December–February reached 70%, while only 20% of the cuttings taken during May–August successfully rooted, Klein *et al.* (2000)

**Effect of planting date and media on root number / plant**

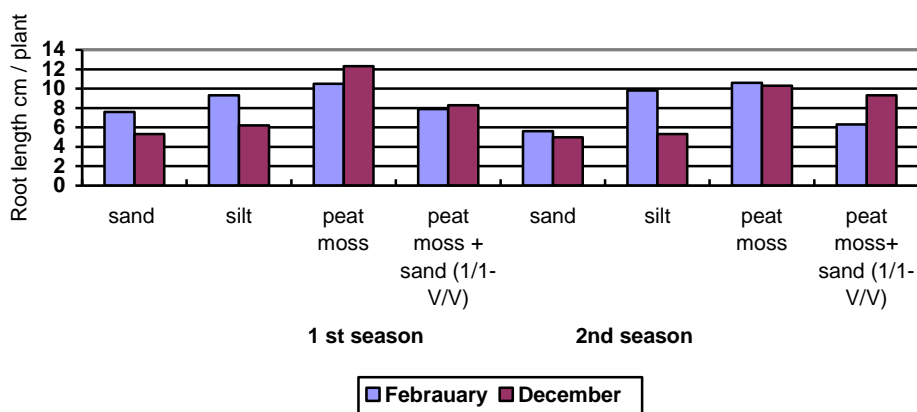
Root number /plant followed a number trend as prementioned concerning rooting percentage. Peat moss medium recorded the highest significant values of root number/plant in February and December months (16.6 and 13.6) in 1<sup>st</sup> season and (11.3 and 11.0) in 2<sup>nd</sup> season respectively comparing with other media. While , sand medium recorded the lowest significant values of root number / plant in February and December months (5.6 and 5.8) in 1<sup>st</sup> season and (6.2 and 6.0 ) in 2<sup>nd</sup> season respectively . In this respect , Kasim *et al.* (2009) reported that, hard wood cuttings of Bitter almond ,gave maximum number of roots/cutting when cuttings were prepared in December .( Fig, 2) .



**Fig. (2): Effect of planting date and media on root number / plant.**

**Effect of planting date and media on root length cm / plant**

In this respect. also, peat moss medium recorded the best significant result of root length (10.5 and 12.3 cm / plant ) in 1<sup>st</sup> season ,while in 2<sup>nd</sup> season were (10.6 and 10.3 cm / plant) in February and December planting respectively. Moreover data show that, no different between root length cm/ plant in cuttings cultured in peat moss medium in February and December planting in both seasons . On the other hand, the lowest significant values were recorded with sand medium it were (7.6 and 5.3 ) in 1<sup>st</sup> season ,while in 2<sup>nd</sup> season they were (5.6 and 5.0 ) at February and December planting respectively.( Fig, 3) .



**Fig. (3): Effect of planting date and media on root number / plant.**

**Effect of planting date and media on shoot length( cm/ plant)**

Peat moss medium recorded the best significant values in shoot length cm/plant comparing with the other media examined in either planting date. The lowest significant values was recorded with sand media comparing with silt and (peat moss + sand ) media . The highest significant values of shoot length cm/plant (30.3 and 31.0, respectively ) were recorded with cuttings cultured in December month in the 1<sup>st</sup> and 2<sup>nd</sup> seasons respectively . Also data show clearly that , the tallest of shoot length cm /plant was recorded in the cuttings cultured in pots full of peat moss medium in February month . On the other hand ,under the sand medium, The lowest values of shoot length cm/ plant (5.2 and 6.3 cm / plant ) were recorded with cuttings cultured in February and December months respectively in 1<sup>st</sup> season and (7.5 and 9.0 cm / plant ) with cuttings cultured in February and December months respectively in 2<sup>nd</sup> season. (Fig, 4).

The previous results showed that, peat moss medium and cuttings cultured in December month were found to be the best factors in rooting cuttings of *Bougainvillea glabra.*, peat moss efficiently removes of phenol ,Viraraghavan and Alfaro (1998) and this was in agreement with Fayek and swedan (1981) they reported that, high rooting percentage of meet-Ghamr peach was proportioned with low concentration of phenolic compound. Moreover, El-Bahy( 1994) reported that, rooting ability of peach hardwood cuttings was increased by reducing the content of total phenols.

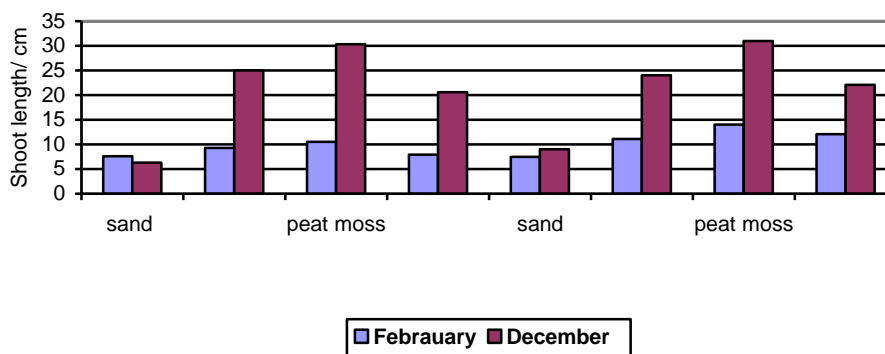


Fig. (4): Effect of planting date and media on shoot length cm/ plant

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**تأثير مواعيد و اوساط الزراعة على تجذير العقل الساقية لنبات الجهنمية**  
**حسين عبد الحق بصيلة ، محمد الفاتح محمد زويل ، محمد عبد الفتاح معوض حمزة و**  
**محمد محمد أمين**  
**قسم البساتين ، كلية الزراعة ، جامعة الأزهر ، مدينة نصر ، القاهرة ، مصر.**

اجريت هذه الدراسة خلال موسمي ٢٠٠٨ / ٢٠٠٩ - ٢٠٠٩ / ٢٠١٠ في مزرعة خاصة بمنطقة القناطر الخيرية لدراسة تأثير مواعيد و اوساط الزراعة على تجذير العقل الساقية لنبات الجهنمية تشير اهم النتائج التي تم التوصل اليها الي أن: استخدام البيت موس كوسط زراعي لتجذير عقل الجهنمية اعطى افضل النتائج من حيث نسبة التجذير (١٠٠ % في كلا الموسمين للعقل المأخوذة خلال شهر ديسمبر. بينما عدد و طول الجذور للنبات لم تتأثر تحت ظروف مواعيد اخذ العقل و ظل وسط البيت موس متفوق معنويا على غيرة من الاوساط حيث سجل في عدد الجذور للنبات (١٦.٦ و ١٣.٦ ، خلال شهري فبراير و ديسمبر بالموسم الاول) و (١١.٣ و ١١.٠ ، خلال شهري فبراير و ديسمبر بالموسم الثاني). وفي طول الجذور سم/ للنبات سجل (١٠.٥ و ١٢.٣ سم للنبات ، خلال شهري فبراير و ديسمبر بالموسم الاول) و (١٠.٦ و ١٠.٣ سم للنبات ، خلال شهري فبراير و ديسمبر بالموسم الثاني). بينما في طول الافرع سجلت العقل المأخوذة خلال شهر ديسمبر ارتفاع معنوي حيث سجلت (٣٠.٣ و ٣١.٠ سم/نبات) عن تلك المأخوذة خلال شهر فبراير حيث سجلت (١١.٠ و ١٤.٠ سم/نبات) بالموسم الاول ثم الثاني.

**قام بتحكيم البحث**

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