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Effect of defoliation and storage of scion stick on survival and scion growth of softwood graft of jamun var. Goma priyanka

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Abstract
The present study was carried out under poly house condition at Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, Gujarat, India during the year 2017-2018 The experiment was laid out in Completely Randomized Design with Factorial concept and repeated thrice with eight treatment combinations. The experiment compromising with two factors (1) Effect of defoliation (with and without defoliation) and (2) Effect of storage of scion stick (1, 2, 3 and 4 days). The results of present investigation revealed that among different defoliation treatment and storage of scion stick, defoliated and one day stored scion stick of jamun var. Goma Priyanka, individually superior in all the growth parameters like minimum days required to leaf emergence, girth, length of sprouted scion shoot, number of shoot and graft survival percentage. Hence it can be concluded that defoliated and one day stored scion stick of jamun var. Goma Priyanka used to softwood grafting for better growth and survival of graft.

Keywords: Jamun, Goma priyanka, sprouting, survival and softwood grafting

Introduction
Jamun are generally propagated by both sexual and asexual method. The most common and simplest method of raising the jamun tree is from seed. As tree do not bear true - to- type fruits it leads to immense variation and fruit character. The seeds have no dormancy and hence fresh seeds can be sown but it is not necessary that plant raised from sexual method are identical to mother plants also lack of improved varieties, long gestation period that the plants obtained from seeds take for fruiting are main responsible factors for not cultivating this crop on orchard scale despite its high potential as a dry land horticulture fruit crop and its multifarious uses. In this context the significance of vegetative propagation in maintenance of genetic uniformity and preservation of identity of clone/ cultivar is well recognized in horticultural crops. Therefore, there is immense need to find out a suitable method of vegetative propagation for quick multiplication of elite jamun plants. The research work on vegetative propagation of the crop is rather scanty and sporadic. Singh *et al*. (1979) [9] tried budding and Madalageri *et al*. (1991) [4] tried softwood grafting (vegetative propagation) of jamun with varying degree of success.

Propagation of jamun through softwood grafting is gaining popularity among nursery men and growers. Softwood grafting gives an excellence response in initial success with least possibility of mortality, better and uniform orchard establishment (Ram and Pathak, 2006) [7]. Moreover, transportation of bud sticks from one place to another is an economic proposition as compared to whole plant is costly and liable to be damaged it transit. An alternate solution to this problem is to procure bud sticks. However, the vegetative propagation techniques through softwood grafting is much influenced by the climatic conditions of the region and is mostly carried out on the onset of monsoon, thereby restricting the availability of planting material for that particular season. (Uchoi *et al.*, 2012) [12].

Storage and defoliation of scion sticks are other method to find out the best possible method for softwood grafting, generally defoliation is done to minimize the transpiration of the scion sticks and prevent wilting of it, also with this one can conclude which method is best for preserving the scion stick for long time defoliated or non-defoliated. Storage is other method to check the best period of days in which scion stick can conserve and use for making successful graft union. This method helps for transporting the scion stick to different areas by

this method one can know the viability period of scion sticks of jamun and can be send to distance place.

Material and Methods

The present study was carried out under poly house condition at Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, Gujarat, India during the year 2017-2018 The experiment was laid out in Completely Randomized Design with Factorial concept and repeated thrice with eight treatment combinations. The experiment compromising with two factors (1) Effect of defoliation (with and without defoliation) and (2) Effect of storage of scion stick (1, 2, 3 and 4 days). The effect of this treatments on days required to leaf emergence (days), girth (mm), length of sprouted scion shoot (cm), number of shoots and graft survival percentage (%) were studied.

Result and discussion

Scion girth

In present investigation significantly maximum incremental girth of shoot observed in defoliated and one day storage of scion stick at 60, 120 and 180 DAG. Maximum girth was observed in defoliated scion stick might be due to presence of more nutrient that cause early bud sprouting and early leaf production causing accumulation of photosynthates in shoot which leads to increased girth of stem (Shama, 2013)[8]. While, minimum girth was obtain in non-defoliated scion.

Maximum girth obtained in 1 day storage of scion stick while, minimum girth was noted in 4 day storage treatment. As storage period increased it was adversely effect on girth of scion stick, decreasing trend of girth might be due to rapid decaying tissue of scion at the cut end as storage period increased (Thakar and Shah, 2013) [11].

Length of sprouted scion shoot

The observations on length of sprouted scion shoot was found significant effect on defoliation and storage of scion stick at 60, 120 and 180 DAG. Significantly the maximum length of sprouted scion shoot was observed in defoliated scion shoot. It might be due to defoliated scion shoot contained more carbohydrates and other food substances (Thakar and Shah, 2013) [11] which cause rapid increased in length of sprouted scion of jamun var. Goma Priyanka.

Among the different storage period maximum length of sprouted scion shoot was observed in 1 day stored scion stick while, minimum length of sprouted scion shoot was obtained in 4 day stored scion stick. This might be due to early sprouting and better union which lead to higher length of scion whereas longer storage period of scion resulted in late union and delayed sprouting which might here resulted in poor growth of graft (Pampana and Sulikeri, 2001) [6]. Also as storage period increased rapid decaying of tissue from cut end of scion stick causing less successful graft union leading to minimum length of scion (Thakar and Shah, 2013) [11].

Number of shoot

It is evident from the study that number of shoots per graft was significantly affected by defoliation and storage of scion stick. Maximum number of shoots were obtained in defoliated scion stick which might be due to more number of active swallow bud which accumulate food material were present in defoliated scion shoot which cause more number of shoots (Adjei and Mante, 2007) [1]. In Jackfruit it was found that more number of shoot is due to activate both the terminal and axillary dormant buds which swallowed through stimulation of parenchymatous cells (Swamy, 1993[10] and Gaoker, 1998[2]). Results were agreed with findings obtained by Shama (2013) [8] in mango. Significant effect of storage of scion stick observed on number of shoots. Maximum number of shoots found in 1 day storage of scion stick while, minimum number of shoots were observed in 4 day storage of scion stick. In present investigation early leaf emergence and more number of leaves were noted in same treatment which leads to photosynthesis and produced more

Graft survival percentage

From the data, it is evident that final graft survival percent significantly increased due to defoliated scion stick it might be due to defoliated scion had more stored food material which is visible as bud swelling which cause rapid formation of callus tissue that allow translocation of vital chemical compounds between stock and scion leading to more chance of graft success and survivability. It also influence growth parameters attributed to initiation of cambium activity which might have resulted from defoliation causing early and strong graft union (Nahar *et al.*, 2015) [5]. Significant difference was observed regarding of final graft survival percentage due to storage of scion stick. Maximum graft survival percentage was observed in 1 day stored scion stick. This may possible due to graft in this treatment had maximum number of leaves and exhibited excellent vegetative growth thus higher photosynthesis rate result in luxuriant vegetative growth and causing maximum survivability (Kumar and Jain, 1998) [3].

Table 1: Effect of defoliation and storage of scion stick on days required to leaf emergence, scion growth and survival of jamun var. Goma Priyanka

Treatments	Days required to leaf emergence	Scion girth (mm)			Scion length (cm)			Number of shoots			Survival (%)
		60 DAG	120 DAG	180 DAG	60 DAG	120 DAG	180 DAG	60 DAG	120 DAG	180 DAG	
Defoliation (D)											
D_1: Defoliated shoot	12.09	5.98	5.03	3.58	4.73	4.24	3.64	1.60	2.60	3.03	61.90
D_2: Non defoliated shoot	16.42	5.35	4.62	3.24	3.80	3.47	2.60	1.43	2.11	2.23	51.98
S.Em. ±	0.23	0.06	0.05	0.04	0.050	0.045	0.037	0.047	0.050	0.055	1.03
C.D. at 5%	0.69	0.17	0.15	0.12	0.15	0.14	0.11	0.14	0.15	0.17	3.08
Storage periods (S)											
S_1: 1 Day	11.36	6.21	5.10	3.67	4.67	4.22	3.63	1.73	2.70	3.10	66.21
S_2: 2 Day	12.90	5.70	4.93	3.50	4.41	4.02	3.30	1.60	2.43	2.73	57.58
S_3: 3 Day	15.49	5.50	4.70	3.28	4.19	3.63	2.92	1.43	2.23	2.50	53.94
S_4: 4 Day	17.29	5.24	4.60	3.18	3.80	3.57	2.64	1.30	2.03	2.23	50.00
S.Em. ±	0.33	0.08	0.07	0.05	0.070	0.064	0.052	0.066	0.070	0.078	1.45
C.D. at 5%	0.98	0.24	0.21	0.17	0.21	0.19	0.16	0.20	0.21	0.23	4.36
Interaction effect (D×S)											
S.Em. ±	0.46	0.11	0.10	0.07	0.10	0.09	0.07	0.10	0.10	0.11	2.05
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV%	5.61	3.46	3.56	4.00	4.07	4.10	4.14	10.77	7.40	7.27	6.25

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