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Effect of growing conditions and manure as a component of growing medium on rooting and growth parameters of some temperate mulberry genotypes

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Abstract
A study on rooting of some temperate mulberry genotypes *viz.*, Goshoerami, Ichinose and KNG was conducted at College of Temperate Sericulture Mirgund, SKUAST-Kashmir. Highest rooting percentage (54.58%) under polyhouse condition was recorded in Goshoerami whereas Ichinose and KNG were statistically at par with rooting percentage of 36.87 and 34.58 respectively. Under open condition highest rooting 11.25 percent was recorded in Goshoerami. Ichinose and KNG were statistically at par with rooting percentage of 8.95 and 9.16 respectively. The average rooting percentage of the three genotypes under polyhouse conditions was 42.01 whereas as under open conditions it was 9.78. Among the media combinations used, higher rooting of cuttings (46.66%) was obtained in case of Sand + Soil + FYM which was at par with Sand + Soil + Vermicompost (45.41%) and least value for rooting (33.95%) was recorded in case of Sand + Soil + poultry manure under poly house condition.

Keywords: Indian mustard, path coefficient analysis

Introduction
Mulberry leaf is the sole food of silkworm (*Bombyx mori* L.) as such production of large number of mulberry plants of improved mulberry genotypes to meet the demand of farmers is of paramount importance. Mulberry can be propagated through different methods like grafting, cutting and layering. Propagation through seeds is not feasible as we do not get true to the type plants as mulberry is cross pollinated. Propagation through grafting too is not economical because it takes around four years to raise saplings fit for supply to field. Propagation through stem cuttings is the easiest, cheapest and quickest method; however, the success of any vegetatively propagated crop depends upon its rooting ability and growth rate of the plant. Genotype-environmental factors and physiological state of the cuttings also play a significant role in determination of success of rooting (Lu, 2002) [3]. In Kashmir valley, most of the mulberry genotypes, both local and exotic, do not respond to clonal propagation under field conditions and show poor rooting. In the present study, effect of growing condition *viz.*, poly house and open condition was studied using different organic manures *viz.*, FYM, Poultry manure and Vermicompost as a component of rooting media for three promising mulberry genotypes namely Goshoerami, Ichinose and KNG.

Material and Methods
Nine month old mulberry shoots were taken from healthy mulberry plants of the three genotypes Goshoerami, Ichinose and KNG for preparation of cuttings. Mulberry cuttings of 15 to 20 centimeters length and1.2 to 1.5 centimeters diameter with three to four active buds were prepared from middle portion of the mulberry shoots of these genotypes. The cuttings were treated with fungicide (Dithane M-45 0.1% For 30 minutes) before planting. Cuttings were planted during last week of March in punctured poly tubes of the size 11 inch height and 4.5 inch diameter containing sand, soil and manure in the ratio of 6:3:1. The fully decomposed manures used as a component of rooting media were FYM, Poultry manure and Vermicompost. The experiment was laid in completely Randomized Design (factorial) under poly house condition and Completely Randomized Block Design (factorial) under open conditions with four replications per treatment and 20 cuttings per treatment per replication.
Observations on sprouting of cuttings were recorded after 30 days of planting where as observations on other growth parameters were recorded after 90 days of planting of the cuttings. For each parameter, three observations per treatment per replication were taken to

arrive at the average values. Data was tabulated and analyzed following standard statistical procedures.

Results and Discussion

Rooting and growth response of mulberry varieties under open and polyhouse conditions

The sprouting was more than 97 percent in all the three genotypes under both the conditions with non significant differences. The Rooting was the highest in Goshoerami 54.58 percent under poly house conditions and 11.25 percent under open field conditions and being significantly higher than the rooting recorded in the other two genotypes under both the conditions.

Peer and Munshi (2006) [5] and Baqual *et al.* (2012) [1] have also reported higher rooting of mulberry cuttings under poly house condition as against natural condition. Higher rooting percentage of mulberry genotypes under poly house condition may be due to the environmental conditions high temperature and high humidity that may have altered the genetic expression of the rooting character. In addition, the variation in rooting percentage under poly house condition may be due to the leaf characteristics of these three genotypes, Goshoerami with thick leaf cuticle as against Ichinose and KNG with thinner cuticle better sustains higher temperature after sprouting. Besides there may be inherent difference in the Auxin content as well as anatomical characteristics of these mulberry genotypes leading to early and late root initiation effecting the subsequent survival. Munshi *et al.* (2003) [4] attributed higher rooting of Goshoerami to its higher nutritional potential and inherent rooting cofactors manifestation under poly house condition. Baqual *et al.* (2004) [2] reported higher percentage of rooting incase of Goshoerami mulberry genotype owing to higher carbohydrate content.

Sapling height was more than 7.66 centimeters in all the three genotypes under open condition and exhibited significant improvement under poly house conditions. Sapling height was the maximum (16.82 cm) in KNG under poly house conditions which was significantly superior over both the genotypes (Table 1). Under open field condition highest shoot biomass (4.27 g) was recorded in Goshoerami whereas Ichinose and KNG were statistically at par. Maximum shoot biomass of 7 grams was recorded in Goshoerami under polyhouse condition being significantly higher than Ichinose (6.69 g) and KNG (6.47 g). Higher sapling height and shoot biomass under poly house condition may be due to early root initiation and high temperature resulting in faster growth.

Under open field conditions, root biomass was highest (2.36 g) in Goshoerami being significantly higher than Ichinose and KNG. Under poly house conditions, root biomass of 3.35 grams was recorded in Ichinose being statistically at par with KNG (3.25 g) and significantly higher than that recorded in Goshoerami (3.12 g). Root volume exhibited significant differences under both the conditions.

Under open field conditions, highest root volume (2.28 cc) was recorded in Goshoerami being significantly higher than the other two genotypes. Under poly house conditions root volume in Ichinose and KNG (3.26 cc and 3.16 cc) was statistically at par and significant over the root volume (2.98 cc) recorded in Goshoerami. Under open field conditions, the length of the longest root was highest (15.27 cm) in Goshoerami and lowest (13.64 cm) in Ichinose. Under poly house conditions the length of the longest root ranged from 16.47 Centimeters in Ichinose to 16.84 centimeters in Goshoerami, but the differences were statistically non significant. There was significant improvement in root biomass, root volume and longest root length under polyhouse conditions which may be because of early root initiation and better growing conditions. The results are furnished in Table 1.

Effect of manures as a component of growing media on rooting and growth of mulberry cuttings under open and polyhouse conditions

Sprouting was more than 97 percent in all the treatments under both the conditions. However, the differences were statistically non significant. Rooting percentage was highest (11.04) with Sand + Soil + FYM being statistically at par with Sand + Soil + Vermicompost (10.20) and lowest (8.12) with Sand + soil+ Poultry manure under open conditions. Highest rooting percentage 46.66 under poly house conditions was recorded with Sand + Soil + FYM being statistically at par with Sand + Soil + Vermicompost with a value of (45.41) and the lowest rooting percentage (33.95) was recorded in Sand + Soil + Poultry manure. The results indicate that there is profound influence of growing conditions on rooting. Adding manure to the growing media may have a secondary effect on the rooting of cuttings by keeping the soil loose and moist there by facilitating rooting and subsequent growth further the soils in Kashmir are mostly clayey in nature tightly layered having more water holding capacity and poor drainage. Adding manure to the growing medium creates ideal conditions for root initiation and subsequent growth by loosening the soil and improving drainage. The higher rooting with FYM and Vermicompost as a component of rooting media may be due to their less acidic nature as against poultry manure. The Sapling height in different treatments ranged from 7.52cm in Sand + Soil + Poultry manure to 7.86 cm in Sand + Soil + FYM however the differences in different treatments were statistically non significant. Under polyhouse condition the manures as a component of the medium had non significant effect on the sapling height. Shoot biomass and root biomass showed significant difference among treatments under open conditions and statistically non significant differences under poly house conditions. Root volume also showed non significant differences among different treatments. There was statistically non significant difference in longest root length under both the conditions.

Table 1: Rooting and growth response of mulberry varieties under open and poly house conditions

Treatment	Sprouting (%)		Rooting (%)		Sapling Height (cm)		Shoot biomass (g)		Root biomass (Fresh wt.) (g)		Root volume (cc)		Longest root length (cm)	
	Open	Poly house	Open	Poly House	Open	Poly House	Open	Poly house	Open	Poly house	Open	Poly house	Open	Poly house
Goshoerami	97.70	98.12	*11.25a	*54.58a	7.66	15.54c	4.27a	7.00a	2.36a	3.12b	2.28a	2.98b	15.27a	16.84
Ichinose	97.29	98.54	8.95b	36.87b	7.72	16.17b	3.60b	6.69b	1.73b	3.35a	1.62b	3.26a	13.64b	16.47
KNG	98.74	98.75	9.16b	34.58b	7.77	16.82a	3.67b	6.47c	1.77b	3.25a	1.65b	3.16a	14.37ab	16.73
Mean	97.91	98.47	9.78	42.01	7.71	16.17	3.84	6.72	1.95	3.24	1.73	3.13	14.42	16.67
C.D ($p \leq 0.05$)	NS	NS	1.89	3.06	NS	0.55	0.28	0.28	0.15	0.16	0.15	0.11	1.36	NS

* Values superscripted by same letters do not differ significantly
NS= Non significant

Table 2: Effect of manures on rooting and growth response of mulberry cuttings under open and poly house condition

Treatment	Sprouting (%)		Rooting (%)		Sapling Height (cm)		Shoot biomass (g)		Root biomass (Fresh wt.) (g)		Root volume (cc)		Longest root length (cm)	
	Open	Poly house	Open	Poly house	Open	Poly house	Open	Poly house	Open	Poly house	Open	Poly house	Open	Poly house
Sand + soil + FYM	98.54	98.95	*11.04a	*46.66a	7.86	15.77	3.59b	6.60	1.99ab	3.17	1.86	3.10	13.95	16.45
Sand + soil + Vermicompost	97.29	98.75	10.20a	45.41a	7.77	16.17	3.99a	6.67	2.03a	3.35	1.94	3.19	15.40	17.22
Sand + soil + Poultry manure	98.74	98.70	8.12b	33.95b	7.52	15.59	3.96a	6.89	1.84b	3.21	1.84	3.12	13.93	16.34
Mean	98.19	98.47	9.78	42.00	7.71	15.84	3.84	6.72	1.95	3.24	1.88	3.13	14.42	16.67
C.D ($p \leq 0.05$)	NS	NS	1.89	3.06	NS	NS	0.28	NS	0.15	NS	NS	NS	NS	NS

* Values superscripted by same letters do not differ significantly
NS= Non significant

Conclusion

Results of the present study indicate that poly house conditions promoted the rooting and growth parameters of mulberry cuttings irrespective of the mulberry genotypes. Hence should be invariably used for large scale production of mulberry saplings of poor rooting genotypes. Sand + Soil + FYM and Sand + Soil + Vermicompost in the ratio of 6:3:1 can be used as a medium for the rooting.

References

1. Baqual MF, Mir MA, Kamili AS, Singh KN, Raja TA, Sharma RK. Behaviour of some indigenous mulberry genotypes of Kashmir valley under polyhouse. International Journal of Science and Nature. 2012;3(3):592-598.
2. Baqual MF, Shiekh ND, Qayum S, Munshi NA, Azad AR, Dar HU. Propagation of Goshoerami through cuttings. Indian Silk. 2004;43(2):8.
3. Lu M. Micropropagation of *Morus latifolia poilet* using axillary buds from mature trees. Scientia Horticulture 2002;96:329-341.
4. Munshi NA, Baqual MF, Malik GN, Qayoum S, Azad AR, Shiekh ND. Studies on rooting behavior of some temperate mulberry cultivars. SKUAST J Res. 2003;5:125-128.
5. Peer KA, Munshi NA. Response of growing conditions on the propagation of temperate mulberry varieties throPugh stem cuttings. Indian Journal of Ecology. 2006;33(2):182-183.