SHORT COMMUNICATION

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Effect of plant growth regulators and chemicals on seed germination of Ker (*Capparis decidua* L.)) under nursery conditions

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Ker (Capparis deciduas L.) of family Capparidaceae is a multipurpose tree which is distributed throughout the arid regions of India and other countries. The plant is xerophytic in nature and is highly tolerant to drought conditions for long period. The plant is used traditionally as anti-inflammatory, laxative, anti-diabetic, anthelmintic, antibacterial, astringent, digestive, diaphoretic and anodyne. Ker fruits are used to make delicious pickle. The major constraint in development of orchards of this species is lack of true to type planting material. This is on account of fact that systematic vegetative propagation technique is yet to be standardized. Presence of inhibitors has been shown in cuttings of ker (Bhargava *et al.*, 2000). Ker is commonly propagated through seeds. However, the uniformity of seed germination and subsequent seedling growth further aggravate the problem. Accordingly, in the present study, an attempt was made to study the effect of different concentrations of GA_3, KNO_3 and Salicylic acid on germination of ker seeds and seedling growth.

The present study was carried out at ICAR-Central Institute for Arid Horticulture, Bikaner, Rajasthan, under shade net house condition during 2014. The experimental design selected was CRD. Fifteen seeds were used for each treatment, which was replicated thrice.

Fully ripen ker fruits were harvested and soaked in water for 12 hours for easy extraction of seeds. Seeds are extracted by crushing the fruits by hand. The different growth regulators and chemical solutions are prepared and seeds are soaked in ten treatments such as, GA_3 100 ppm, GA_3 200 ppm, GA_3 300 ppm, KNO_3- 1%, KNO_3- 2%, KNO_3- 5%, Salicylic acid- 100 ppm, Salicylic acid 200 ppm, soaking in water for 12 hours and shade dried for 12 hours and untreated control. Then the seeds were sown in polythene bags (25x10cm) containing pot mixture consisting of sand, FYM and soil (1:1:1) during last week of May. Light irrigation was given under nursery at alternate day interval. They were examined daily for germination counts after the date of sowing. The date of first plumule emergence from the seeds above soil level was recorded and computing the difference between date of sowing and plumule emergence was recorded as days required for germination The seeds which showed the emergence of cotyledon leaves were considered as germinated. After 30 days, the number of seeds germinated in each replication were added and calculated on percentage basis as below (Stephen, 2008).

$$\text{Germination (\%)} = \frac{\text{Number of seeds germinated}}{\text{Total number of seeds sown}} \times 100$$

The experimental values were analyzed statistically by using completely randomized design (CRD) with three replications of each. Means were compared using

WASP (WEB Agri Stat Package ICAR Research Complex Goa) test at 1% level of significance.

Data presented in table 1 showed that, the significant differences were found among the treatments for germination. The days taken for initiation and 50 per cent germination were very minimum in seeds treated with GA_3 300 ppm (7.20 and 7.80 days, respectively) which was at par with GA_3 200 (7.40 and 8.0 days respectively) and GA_3 100 ppm (7.60 and 8.40 days respectively). Maximum number of days were taken in control (11.8 and 14.2 days) respectively. The initiation of germination was earlier in GA_3 treatments due to the stimulative effect of gibberellins on germination of seeds. It initiates synthesis of hydrolyzing enzymes, particularly amylase, which produces hydrolyzed food which is utilized for growth of embryo and thereby enhanced the germination (Paleg, 1965). Similar results were also reported in guava by Rodriguez (1985) and Suryakanth *et al.* (2005); in mango by Muralidhara *et al.*, (2015), Venkata Rao and Reddy, (2005), Shalini *et al.*(1999) and Padma and Reddy, (1998) and in khirni by Reddy and Khan (2001). It has also been postulated that GA_3 might antagonized the effects of inhibitors present in seeds (Kalyani *et al.*, 2014). Similarly, the treatment with different concentrations of KNO_3 also reduced the days taken for initiation of germination and days taken to 50% germination as compared to control. This is illustrated by the fact that days taken for 50% germination were 10, 9.4 and 12.40 days at 1%, 2% and 5%, respectively as compared to 14.20 days with control. This may be due to the priming effect of KNO_3 which led to improvement in uniformity of germination.

The highest percentage of germination (97.33 %)

was noticed, in seeds which were treated with GA, 300 ppm. This was at par with GA_3 200 ppm (94.66%) and GA_3 100 ppm (91.99%). Minimum germination percentage was recorded in control (64%). Similar results were also shown by KNO_3 and Salicyclic acid which also improved germination percentage to the tune of above 80%. There is no significant difference for survival per cent of seedlings. The poor germination of seed is a problem in Ker but survival per cent is very low due high temperature and hot blowing wind. The maximum loss of seedlings was noted at initial stage of growth after germination due to soft fleshly tender plants.

Thus from the foregoing account it can be concluded that application of GA_3, KNO_3 and Salicylic acid improves germination percentage as well as uniformity of germination

Table 1. Effect of presowing seed treatments on germination of Ker under nursery conditions

Treatments	Days taken for Initiation of germination	Days taken to 50% germination	Germination (%)	Survival (%)of seedlings
GA_3 100 ppm	7.60	8.40	91.99	29.01
GA_3 200 ppm	7.40	8.00	94.66	28.19
GA_3 300 ppm	7.20	7.80	97.33	30.19
KNO_3 1%	8.40	10.00	84.00	27.05
KNO_3 2%	8.40	9.40	89.33	26.92
KNO_3 5%	9.40	12.40	81.33	27.89
Salicylic acid 100 ppm	9.40	11.40	81.33	27.94
Salicylic acid 200 ppm	9.40	10.80	80.00	25.14
Water soaking	10.20	12.60	81.33	23.02
Control	11.80	14.20	64.00	22.88
CD (0.01)	0.88	1.38	7.39	NS

of seeds in *Capparis decidua*.

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