



RESEARCH ARTICLE

EFFECT OF PRETREATMENTS ON SEED GERMINATION AND SEEDLING GROWTH OF SIZE GRADED *AEGLE MARMELLOS* (L.) CORR. SEEDS

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ABSTRACT

Aegle marmelos(L.)Corr. (Rutaceae family) is endangered medicinal tree. The Present study was carried out to know the effect of pretreatment on seed germination and seedling growth parameters of size graded *A. marmelos* seeds viz. large, medium and small. There was no significant influence were observed in germination percentage but the root and shoot length was significantly increased in hot water treated (10min and 15 min.) seedlings compared to control and other treatments.

INTRODUCTION

Trees have been considered as essential part of the life and their importance being described in epics. Many traditional societies all over the world value a large number of plant species for a wide variety of reasons viz., food, fibre, shelter, medicine, etc., (Ramakrishnan, 1998) Worshipping and giving respect to sacred trees are ancient tradition of India. *A.marmelos* is a scared and endangered medicinal tree belonging to the family Rutaceae. Its parts are used in Ayurveda and siddha medicines to treat a variety of ailments (Venudevan *et al.*, 2013). The roots are useful for treating diarrhea and dyspepsia. The aqueous stem and bark extracts are used as medicine for malaria, fever, jaundice, ulcer and eczema (PallabMaity *et al.*, 2009). In India *Aegle marmelos* is RET listed (endangered)by the Foundation for Revitalization of Local Health Traditions (FRLHT), Bangalore, therefore extra importance is given for mass multiplication through afforestation. This tree is normally propagated through seeds. Seed size has been found to regulate the germination and subsequent seedling growth in many species (Gupta *et al.*, 1983). The rapid, complete and uniform growth of nursery stock is essential for better survival and establishment of seedling in the field to achieve good plant population from seeds. Since the present study was carried out to find out the

effectiveness of size graded seeds in various pretreatment methods to understand the behavior of seed germination and seedling growths.

MATERIALS AND METHODS

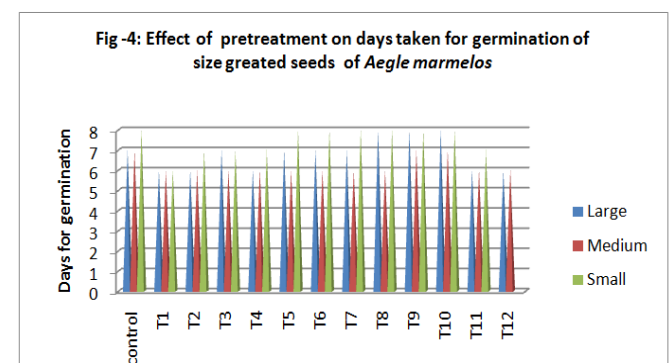
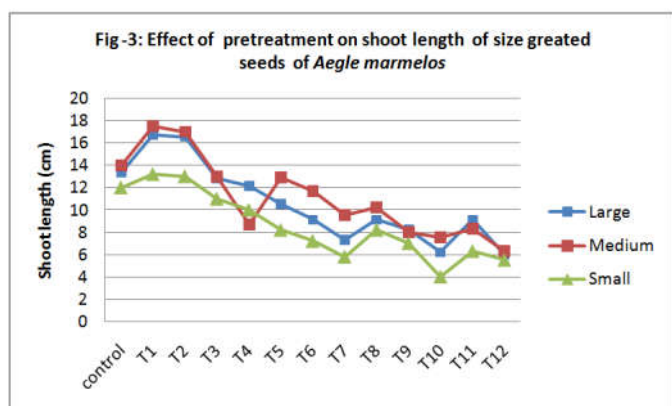
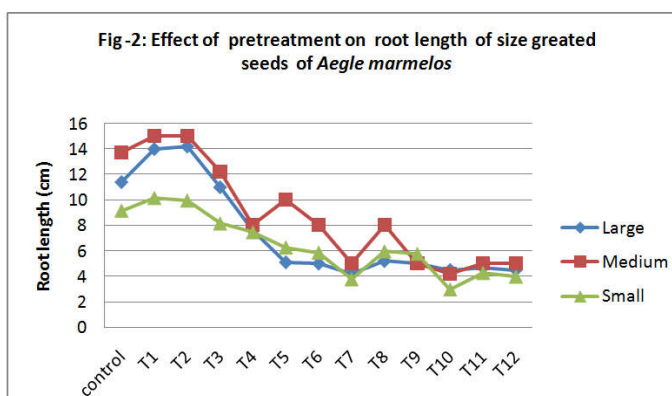
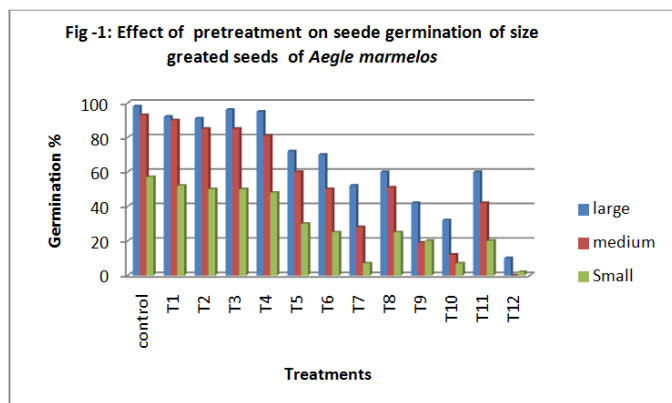
The freshly collected seeds of *A. marmelos* were sorted out into three groups namely large, medium and small on the bases of visual observation. The following treatments was given to the seeds

- T0: Control (non-treated)
- T1: Seeds were soaked in warm water (50-55°C) for 10 minutes,
- T2: Seeds were soaked in warm water (50-55°C) for 15 minutes,
- T3: Seeds were placed under running tap water for 12 hours,
- T4: Seeds were placed under running tap water for 24 hours,
- T5: Seeds were soaked in concentrated sulfuric acid for 10 minutes,
- T6: Seeds were soaked in concentrated sulfuric acid for 20 minutes,
- T7: Seeds were soaked in concentrated sulfuric acid for 1 hour,
- T8: Seeds were soaked in concentrated nitric acid for 10 minutes,
- T9: Seeds were soaked in concentrated nitric acid for 20 minutes,

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- T10: Seeds were soaked in concentrated nitric acid for 1 hour,
 T11: Seeds were manually by rubbing on sand paper at the cotyledon ends,
 T12: A small piece of seed coat was removed mechanically using razor blade.



After pretreatment by various methods (T1- T10), the seeds were thoroughly washed in tap water and were sown in 30cm X 11cm polythene bags containing sand medium kept at room temperature (28±2°C). The germination studies were carried

out with five replicates and each replication consisted of fifty seeds of uniform size. The mechanically scarified (T11 and T12) seeds are sown immediately. Watering was done daily and germination was recorded on alternate days during 90 day period for experimentation. The statistical analysis was done by the method of Duncan's Multiple Range Test (DMRT).

RESULTS AND DISCUSSION

The germination percentage in the size graded seeds of *A. marmelos* exposed to different treatment was higher among the untreated seed groups (98%) (Fig.-34). Similar higher percentage of germination for untreated seeds of *Albizia lebeck* and *Albizia procera* was already reported (Millat- E- Mustafa, 1989; Ali *et al.*, 1997). The lower germination in the treated seeds may be due to the inhibitory effect of hot water and acid treatment on readily germinable seeds. These results are concordant with early reports (Ali *et al.*, 1997). In the present study all the three sized seeds of *A. marmelos* treated with warm water for 10 minutes and 15 minutes exhibited more root and shoot length compared to untreated seeds (control) (Fig-2& 3). Boiling water removes the cuticle and sometimes part of the palisade layers of the seed and effectively break the dormancy. Similar result were observed in *Dichrostachys cinerea* seeds scarified with hot water for 40 minutes was found to be the best in germination and radicle length and *Acacia mellifera* seeds at the boiling point for a period of 16 hours improved the germination and vigour (Roy And Pathak, 1985; Jerlin and Vedivelu, 1994). In the case of large seeds the germination was significantly enhanced in T1, T3, T4, T5, T6, T8, T11 and T12 treated seeds within 6 days were as it took 7 days for the seeds without any treatments. In the case of medium sized seeds the T1, T2, T11 and T12 treated seeds and in small sized seeds T1, T2, T3, T4, T11 and T12 treated seeds enhanced earlier germination compared to that of control (Fig-4). The root and shoot length of the size graded seeds was found to be increased after 90 days in T1 and T2 treated seeds compared to that of control. So other pretreatment methods of size graded seeds of *A. marmelos* have no effect on germination and growth.

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