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Improvement Seed Germination of Wild Service Tree (*Sorbus aucoparia* L.) by Gibberellic Acid

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ABSTRACT

In order to evaluation of the effect different levels of gibberellic acid (0, 1000, 2000 and 3000 mg l^{-1}) on seed germination of Sorbus aucoparia L. *a randomized completely design experiment was carried out. In this research germination rate, germination value and germination percentage was recorded. Analysis of variance showed that effect of gibberellic acid on traits was significant ($p \leq 0.05$). Results showed that 1000 mg l^{-1}gibberellic acid has highest germination rate (15.75 days), germination percentage (50.42%) and germination value (2.45).*

Key words: *Sorbus aucoparia*, germination rate, germination percentage, germination value, gibberellic acid

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INTRODUCTION

The wood of wild service tree (*Sorbus aucoparia* L.) which belongs to Rosaceae family is highly valuable in the furniture industry [2, 13]. Sexual propagation of service tree is very difficult, dormancy is most important inhibitor for rapid germination [1, 10]. Pretreatment of gibberellic acid is useful for overcome to this problem [9, 13, 14]. Fattahi et al. [4] showed that the effect of moist chilling and gibberellic acid had positive effect on germination percentage of *Salvia reutreana*. Dehghan & Perez [3] demonstrated that gibberellic acid and sulphuric acid increased germination percent of caribean (*Caribean applecactus*). The aim of this study is investigation on effect of different concentrations of gibberellic acid on germination and breaking dormancy of *Sorbus aucoparia*.

MATERIALS AND METHODS

Seeds of wild service tree (*Sorbus aucoparia* L.) were collected from ornamental garden of North part of Iran. Seeds were washed with top water and then pretreated with gibberellic acid. This experiment carried out based on randomized completely design with four levels of gibberllic acid (0, 1000, 2000 and 3000 mg L^{-1}) at 3 replications and 12 plots. In this study germination rate (GR), germination value (GV) and germination percentage (GP) were recorded and determined by these formula [14]:

$$GP = \frac{\text{number of germinated seeds}}{\text{total number of seeds}} \times 100$$

$$GR = \sum_{i=1}^{n} \frac{Si}{Di}$$

Where: S_i = No. of germinated seeds per each calculation
D_i = No. of days until calculation
n = No. of calculations

$$GV = PV * MDG$$

That PV is pick value and MDG is main daily germination.

Analysis of variance (ANOVA) was done using SPSS and SAS softwares and means were compared by LSD test at 1 and 5% probability.

RESULTS AND DISCUSSION

Analysis of variance showed that effect of gibberellic acid on traits was significant ($p \leq 0.05$). Results showed that 1000 mg L^{-1} gibberellic acid had highest germination rate (15.75 days), germination percentage (50.42%) and germination value (2.549). (Table 1)(Fig. 1). Positive effect of gibberellic acid on measured traits due to hormonal regulation, retarding abscisic acid activity, and increasing of α-amylase activity [5, 12, 13]. Our results agreement by Var et al. [13] and Gultekin et al. [6]. Reports about *Cycas revoluta* demonstrated that pretreatment by gibberellic acid and scarification enhanced germination rate, percentage and value [7, 14]. Dehghan & Perez [3] showed that gibberllic acid at 1000 mg L^{-1} concentration improved germination percentage of *Cycas*. Kochacki and Azizi [8] showed that gibberellic acid improved germination percentage and seedling growth of *Teucrium polium*. Similar reports in *Cyclamen persicum* [11], *Sorbus torminalis* [13] were observed.

Table 1. Effect of gibberellic acid on germination characters of *Sorbus aucopria*

Treatments	Germination rate (days)	Germination perecentage (%)
Control	23.30 a	36.25 b
Gibberellic acid 1000 mg l^{-1}	15.75 b	50.42 a
Gibberellic acid 2000 mg l^{-1}	19.34 ab	42.50 ab
Gibberellic acid 3000 mg l^{-1}	22.02 a	38.33 b

**In each column, means with the same letters are not significantly different.*

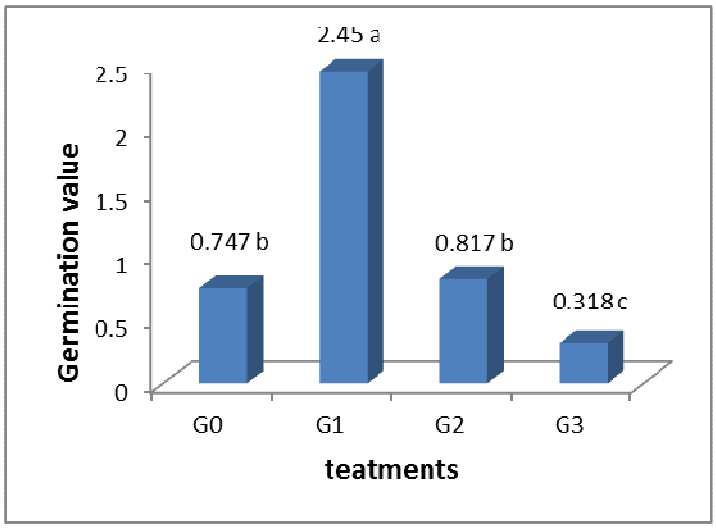

Fig 1- Effect of gibberellic acid on germination value of *Sorbus aucopria* L.
G_0: control, G_1: 1000 mg l^{-1}GA , G_2: 2000 mgl^{-1}GA, G_3:3000 mg l^{-1}GA
**In each column, means with the same letters are not significantly different.*

CONCLUSION

In this study 1000 mg l^{-1} gibberellic acid improved germination rate, germination percentage and germination value of *Sorbus aucoparia* L.

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