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EFFECT OF PLANT GROWTH HORMONES ON SEED GERMINATION AND SEEDLING GROWTH OF ABRUS PRECATORIUS (L.)

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ABSTRACT

Study was conducted to assess the effect of plant growth hormones on seed germination and seedling growth of *Abrus precatorius* (white seed). Seeds of *Abrus precatorius* treated with plant growth regulators. It was observed that the seeds of *Abrus precatorius* treated with IAA 200 + IBA 200 ppm were proved favorable to express maximum percent germination, shoot length and number of leaves as compared with other treatments.

***Key words**: Abrus precatorius, Germination, root length and shoot length.*

INTRODUCTION

Abrus precatorius (L.) is commonly known as Gunja belonging to family Fabaccae. Plant is considered as a valuable source of natural products against diseases. The roots, seeds and leaves are used in traditional medicine (Choi et.al 1989).The leaves of the herb are used to cure fever, cough and cold. The roots are used to treat jaundice. Paste of roots is used to abdominal pains and also for abortion. In the Ayurvedic medicine, seeds also have some potential ingredients which are of good source of insecticide (Khanna and Kaushik 1998).

A dormant seed are unable to germinate in a specified period of time under a combination of ecological factors that are suitable for the germination of non-dormant seed. (Bewley and Black, 1982). Various methods have been used by seed scientists to break seed dormancy in medicinal plants. For the endangered state of many of the medicinal plants, many factors, such as human settlement, natural calamities, unscientific exploitation and road construction were responsible (Kumar et.al 2011). On the current market, demand is increasing and the supply of herbal drugs is decreasing.

(Srivastava et.al 2010). Thus, to fulfill the gap between supply and demand there is an urgent need to conserve and cultivate medicinally important plant species.

MATERIALS AND METHODS

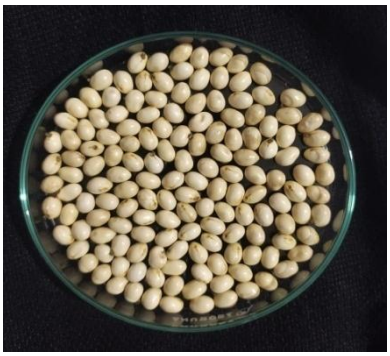
1] Application of growth regulators to seeds.

Collected seeds were sown during the months of June. Seeds were first surface sterilized for 1 minute in 0.1 % $HgCI_2$ solution for 5 minutes and subsequently washed with water. The experiment was arranged as a completely randomized design with three replications for each treatment. Seeds were treated with Indole-3-Acetic Acid (IAA), Indole-3-Butyric Acid (IBA), Gibberlic Acid (GA), hot water treatment, presoaking treatment. The treated as well as untreated seeds were sown in each polybags at a depth of 1.5 to 2.0 cm, Paramathma *et al.*, (2004). All plants were harvested to determine percent germination, shoot height, root length and number of leaves.

2] Statistical Analysis.

In the present work data was analyzed statistically, Standard Deviation, Standard Error and Critical Difference was calculated.

1. *Abrus precatorius* flowers



2.Seeds

RESULTS AND DISCUSSION.

In order to understand the effect of plant growth hormones on seed germinability of *Abrus precatorius* (white seed). The seeds were treated with different plant growth hormones for different concentration. Percent germinability, shoot length and root length in cm were observed. The results are briefed in the table 1.

Table 1. Effect of plant growth hormones on seed germination and seedling growth of *Abrus precatorius* .

Treatment (ppm)	*Abrus precatorius*			
	Mean			
	Germination (%)	Shoot length (cm)	Root length (cm)	No. of leaves
IAA200	40	12.41	10.25	9.41
IBA200	50	12.57	9.41	7.38
GA 200	50	10.41	10.71	8.34
IAA 200 + IBA 200	80	15.25	10.78	10.68
IBA 200 + GA 200	80	14.98	11.83	10.26
Hot Water	50	12.22	9.52	8.37
Control (Pre-Soaked)	40	10.12	9.35	8.46
S.D	17.18	1.99	0.92	1.18
S.E	6.49	0.75	0.35	0.45
C D	16.69	1.93	0.89	1.14

Indole-3-Acetic Acid (IAA), Indole-3-Butyric Acid (IBA), Gibberlic Acid (GA),

The results are mentioned in table 1. It is clear from result summarized in table 1 that the seeds of *Abrus precatorius* treated with IAA 200 + IBA 200 ppm were proved favorable to express maximum percent germination (80 %), shoot length (15.25) and number of leaves (10.68). In case of IBA 200 + GA 200 ppm were proved favorable to express maximum root length (11.83) followed by IAA 200 + IBA 200 ppm (10.78) as compared with control. All results are statistically significant. Similar results had been reported by different workers as GA was most effective in which seed germination increased by 47% (Dhoran and Gudadhe, 2012). IBA also has been reported to increase seed germinability of *Jatropha curcas* (Kumari et al., 2010). Gibberellic acid increases the activity of the protease enzyme and changes proteins to amino acids such as tryptophan. Gibberellic acid also modulates the dry weight of plants because it increases the leaf area and photosynthesis (Lester et al, 2002). Gibberellic acid functions as a regulator for plant growth through increasing cell division and cell elongation and replication, (Salehi et al., 2014) observed that the influence of growth regulators (IAA+ IBA and IAA+ NAA) on seed germination and seedling growth of

Syzygium cumuni. He was observed that IAA + IBA at 600 ppm favoured maximum seed germination.Gaikwad (2019) studied and concluded that the influence of different growth regulators (IAA+ IBA and IAA+ NAA) on seed germination and seedling growth of *Syzygium cumuni*.

In order to study the incidence of infection of fungi on infected seeds of *Abrus precatorius*, the experiment was conducted. The results are mentioned that in IAA 200 + IBA 200 ppm chemical treatment, 02 different types of fungi was found to be observed namely *Aspergillus niger, Aspergillus flavus* and seeds treated by IAA 200 + IBA 200 ppm treatment 03 different types of fungi was found namely *Aspergillus niger, Aspergillus flavus. Mucur* spp, (Boosanur et.al., 2006) isolated *Alternaria helianthi, A. zinnial* from seeds of *Helianthus annuus*. (Sinniah et.al. 1983) recording *Aspergillus niger, A. quircinus, Penicillium citrinum* from seeds of *Strychnos nux vomica*.

CONCLUSIONS.

Pre-sowing phytohormones treatments of seeds plays important role to increase the seed germination under nursery conditions. Among the pre-sowing seed treatments, the best treatment for the sowing of *Abrus precatorius* seeds are IAA 200 + IBA 200 ppm were proved favorable to express maximum percent germination, shoot length and number of leaves. In case of IBA 200 + GA 200 ppm were proved favorable to express maximum root length.Therefore IAA 200 + IBA 200 ppm treatment may be recommended for plantation programme.

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