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GERMINATION AND VIABILITY CAPACITY OF SEEDS OF *WITHANIA SOMNIFERA* (L.) DUNAL

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Abstract

Rate of germination of seed of *Withania somnifera*, is usually different in different species varieties or members of *Withania somnifera* L. Dunal (Ashwagandha) (Sharma, et.al., 2015). The mycoflora percentage of seed is also about different in different species of Ashwagandha. (Ingle & Kareppa, 2009). *Withania somnifera* (L.) Dunal (Solanaceae) is generally reproduced by seeds. The percentage of germination is low, because of the presence of some inhibitory substances in the fruit. Among all the local and Indian cultivars, the pharmaceutical industries mostly give preference to the Indian cultivars as their roots have starchy nature. The local cultivars are preferred as threatened plant. In the recent studies, *W. somnifera* was mass propagated *in vitro* in a successful manner, habituated and compared with seed raised plants (De Silva, & Senarath, 2009).

Key words- Germination, Ashwagandha, mycoflora, solanaceae, inhibitors, *in vitro* propagation, local cultivars etc.

Introduction

A rapid procedure for smooth and optimum propagation for *Withania somnifera* (a medicinally efficacious multipurpose plant), was done to involve in the study of the effect of temperature, physico-chemical treatments, photoperiod, growth regulators (IAA, IBA, 2–4 D and BA) and storage on product ability. The most responsive and effective treatment is GA_3 at 150 µg/ml concentration at 25 ℃. The optimal temperature for germination is 25 ℃ and continuous light favours reproduction indicating that photoperiod has a determined role. The seedlings produced from seeds shows good results when grown in a glasshouse (Khanna,et.al.,2013).

Material and Methods

Specimen collections

The seeds of the cultivated variety of *Withania Somnifera* L. (Dunal) were obtained from the local nurseries and research institutions. The seeds were rinsed with 90% ethyl alcohol for 10 second followed by 0.1% Mercuric chloride for 15 min. Then seeds were washed 4- 6 times in sterile double distilled water or autoclaved water to remove all traces quantities of $MgCl_2$. Five to seven seeds were inoculated in a culture tube having 20ml of MS medium (Murashige & Skoog, 1962) which contains 3% sucrose and 0.8% agar (Himedia, India). The optimum PH of the medium was taken to be 5.8 before the autoclaving at 15 lbs pressure and 121^0C for 20min. Here all the given cultures were incubated at 25±2°C with 16 hrs photoperiod provided by cool while fluorescent tubes. Fresh leafs for the experiment was collected from two month old seedlings grown *in vitro*. Ashwagandha seeds were difficult to germinate because due to the occurrence of inhibitors of germination. Kambizi, et.al.,(2006) tried several techniques for the improvement of the germination capacity of seeds and obtained only a maximum germination capacity of about 35%.

Results and Discussion

Table:- Viability and Germination Capacity of seeds of cultivated and wild traits of *Withania somnifera in vitro* condition

S.No	Types of seeds	Viability and germination capacity (%)
1.	Cultivated	66-70
2.	Wild	75-80

Before the inoculation the Laminar Air Flow was subjected for UV light transmission for about 30-45 minutes. The inoculation of seeds was done under aseptic conditions under Horizontal Laminar Air Flow. The germination capacity of seeds of about 70-80% by the treatment of seeds before propagation with thiourea (i.e. mixture of IAA + GA3) with mechanical scarification at temperature of 25°C.The viability and germination capacity of seeds of wild *Withania* is greater than *in vitro* condition therefore wild plants in comparison to cultivated plants cultivated more easily *in vitro* conditions. After this large numbers of young plants produces *in vitro* condition for tissue culture operations. Fresh leafs for the experiment was collected from two month old seedlings grown *in vitro*.

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