SEED DORMANCY STUDIES IN CUCUMBER (*CUCUMIS SATIVUS L.*) CV. SHITAL

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Abstract:
Eight different Physio-chemical treatments were evaluated for breaking the dormancy of freshly harvested cucumber c.v. Shital Seeds. Among them seeds dried at 45°C for 72 h or soaked in 1000 ppm solution of GA3 for 24h. Showed highest germination 69% and 60% respectively then the control 51%.
Keywords: Medicinal plant, seeds germination, *Withania somanifera, Ocimum pallens, Artenisia pallen, Solanum viarum.*

Introduction

Dormancy was reported in an Indian cucumber cv. Baroda (1) The nucellar membrane or the inner integument is reported to contribute to such impermeability (2,3). Ariyaratne and Weersena (4) suggested amethod to overcome the dormancy in freshly harvested cucumber seed by cutting seeds through the radical end to severe the nucellar membrane followed by soaking in 0.34 M NaCl for 16 h. Though effective, this method is not feasible on a large scale since it is a laborious one. The present investigation was under taken to device an easy and economical method to overcome dormancy existing in cucumber cv. Shital.

Materials and Methods

The seeds of cucumber (Cucumis sativus L.) cv. Were extracted from mature fruits grown during the summer season of 2014. The empty and half filled seeds, which floated when soaked in water, were discarded. The fresh seeds were tested for viability by using Tetrazolium test (T.Z.) and germination as per ISTA rules (5).

A number of physio-chemical treatments (Table-1) were evaluated for breaking the dormancy of freshly harvested cucumber seeds. After the treatments, seeds were tested for germination as per ISTA Rules (5). The data on normal seedling and fresh ungerminated seeds was analysed in CRD. The viability, as dertermined by T.Z. test, was 94 percent whereas the germination at 0 day was 35 percent indicating that seeds of Shital cultivar possessed dormancy.

Results and Discussion:

The percent germination and fresh ungerminated seeds at different intervals showed significant differences. The germination was about 30 per cent immediately after harvesting (0 day testing) which increased steadily from 30 to 96 per cent after 49 days indicating complete release of dormancy. The increased germination was accompanied by decreased in the percentage of fresh ungerminated seeds from about 70 (0 day) to 0 percent (49 days). This suggested that the period of dormancy in cucumber c.v. Shital seeds was upto 49 days after harvest.

The effect of seed treatments on germination and proportion of fresh ungerminated seeds was significant (Table 1). Among the various treatments, drying of seeds in hot air oven at 45°C for 72 h exhibited the highest germination (69%), followed by the treatment of seeds with 1000 ppm GA3 (60 %). In the present study, drying at 45°C for 72 h appeared to break the impermeability of nucellar membrane, promoting oxygen intake and imbibitions of water thereby breaking dormancy. Earlier reports showed that the nucellar membrane contributed to t he impermeability (2) while intact inner integument was responsible for maintaining the dormancy in cucumber (3).

The seeds soaked either in water or in GA3 for 24 h recorded 44 to 45 percent increase in their weight due to imbibitions. In most of the species the seed weight normally doubles during germination (6). This supports the earlier views regarding the impermeability of the inner integuments in cucumber, which could partially explain why the seeds could not show complete release from dormancy even after 24 h of soaking in 1000 ppm GA3. Contrary to this

cutting through the nucellar membrane was reported to release dormancy completely (4).

According to the Minimum Seed Certification Standards, cucumber seeds must record 60 percent germination which could be attained if the seeds are dried at 45°C for 72 h or soaked in 1000 ppm solution of GA3 for 24 h, before germination. However, there is a need to investigate, whether imposition of dormancy in cucumber seed is due to a combined effect of impermeability of the integuments and a balance of growth substances in the embryo.

Table 1. Effect of various treatments on germination (%) of freshly harvested seed of cucumber.

Treatment	Duration (h)	Normal Seedling	Fresh ungroemi.	Abnormal Seedling	Dead Seed.
Water soaking	24	54.00	40.00	5.00	1.00
Water soaking	48	44.00	40.00	10.00	6.00
KNO3 1% solution	24	39.00	60.00	1.00	0.00
GA$_3$ 500 ppm	24	47.00	50.00	2.00	1.00
GA$_3$ 1000 ppm	24	50.00	36.00	3.00	1.00
Drying at 45 c	72	69.00	25.00	3.00	2.00
Drying at 45 c	120	55.00	38.00	3.00	4.00
Drying at 60 c	2	45.00	51.00	2.00	2.00
Control* (No treatment)	-	30.00	65.00	3.00	2.00
Mean		51.00	46.00		
SE ± CD (P=0.05)		1.12 3.19	1.18 6.00		

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