Studies on seed viability of some medicinal plants

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SUMMARY
"A seed is germinated when the radical bursts through the outer covering". Germination test is not possible in seeds with underdeveloped embryo, dormancy, hard seed coat and in the conditions not favorable for germination. Seed viability is the state of being capable of germination and subsequent growth and development of normal seedling. In the current paper the emphasis will be given on the seed viability study of Medicinal plant i.e., *Andrographis paniculata* and *Gymnema sylvestris* through seeds by biochemical test and cutting test. These tests are in practice since long time.

Key words : Germination, Embryo, Viability, Seed, Biochemical, Dormancy, *Andrographis paniculata* and *Gymnema sylvestris*

Seed viability is defined as the state of being capable of germination and subsequently growth and development of the seedling. Thus it can be said that a viable seed is one which is capable of germinating under proper circumstances (Bonner, 1984).

The seed viability is usually accessed by means of standard germination test requiring a minimum of three weeks (sometime six weeks). Viability is largely governed by environmental factors specially the conditions that reduce the metabolic activity of seeds, which limits the capacity of seed to germinate on intense low temperature or very high temperature, is sure to kill the viability of seeds prior to germination.

The term "Viability" has been defined by many workers in different ways, Baldwin (1942), suggested seed viability as the possibility of growth and referred it to the potential capacity of seed to germinate. Barton (1961), pointed out that the viability is a condition of seeds in the sense of being capable of growth and survival. Schupmeyer (1974), stated that viability is the potentiality of seed to germinate. Agrawal (1980), described viability as the ability of seeds to live, grow and develop. In this paper for the seed viability test, we have selected two medicinal plants i.e. *Andrographic paniculata* and *Gymnema sylvestris.* Two tests are performed for the seed viability study of the seeds i.e. cutting test and biochemical test. In biochemical test two parameters are included, they are Indigocarmine test and Tetrazolin test.

Both cutting and biochemical process are essential for maintaining the viability of seeds and have been the subject of intense research during the past few decades.

MATERIALS AND METHODS

In all the tests performed to access viability and

vigour of different herb seeds, minimum 5 replicates of 100 seeds were taken and the results were expressed in terms of mean value.

Assessment of seed viability

The assessment of seed viability has been done by two tests -

1. Cutting test

Imbibed seeds were cut longitudinally into two halves with the help of blade. Cut halves were placed on glazed glass plate for further observations. The evaluation was done by naked eye to find out healthy, sound empty and immature seeds in the sample. Seeds with normal colour of endosperm and well developed embryo have been considered viable and germinable. Whereas seed without embryo or abortive embryo or with milky, mouldy, decayed shriveled were considered as non-viable .

2. Biochemical test

The biochemical test of seeds vibility was done by 2,3,5 Triphenyl Tetrazolium Chloride (TTC) Indigocarmine (I.C.) staining test. The preparation of samples for staining can be done after ISTA (1985).

The various steps for testing viability of seeds by Triphenyl Tetrazolium Chloride and Indigocarmine (I.C.) solution is described in brief below:

a. Per – moistening of seed samples

The seed were imbibed in distilled water for a period of 24 hours. Imbibed seeds were placed on filter paper to drain excess water. During this period activations of enzymatic process take place and the tissue become less fragile. Before immersion of seeds in the staining

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