

## EFFECT OF IMBIBITION ON GERMINATIVE CAPACITY IN SEEDS OF *CASSIA FISTULA* (LINN.)

SACHIN SINGH

Department of Botany, Bipin Bihari College, Jhansi (U.P.) India.

Different durations of imbibition effect the germinative capacity of seeds, which can be attributed to the increased hydration initiating metabolic activities in embryos of seed. The maximum imbibition in seeds of *Cassia fistula*, as well as percent germination, was observed in forty eight hours of soaking.

**Keywords :** *Cassia fistula*; Germinative capacity; Imbibition.

The process of water imbibition is affected by nature of seed coat and its permeability to water, which in turn affects the process which leads to quick and better germination, as it is reported in a number of plant species. Largen and Lwanga<sup>1</sup> have studied the effect of prolonged seed soaking on seedling growth of *Pisum sativum*. Chatterji and Mohnot<sup>2</sup> reported that imbibition affects germination of seeds to a considerable extent. From existing literature it appears that there is a scarcity of data on seed germination of tropical forest trees in relation to imbibition. It has close relation with hydration of seed protoplast and other metabolic activities due to which dormant embryo of seed restores its activities and germinates. The present paper deals with the soaking of seeds in sterilized water for different durations and assessment of their germinative capacity in *Cassia fistula*.

Seeds of *Cassia fistula* were collected from Bangawa and Orchha forest in the month of April to May, 2007. Seeds were extracted from the pods and stored in glass bottles at room temperature (15-35°C). The tests were performed in Sept., 2007.

Twenty five treated seeds of *C. fistula* were weighed and surface sterilized with 0.001M HgCl<sub>2</sub> solution<sup>1</sup> for five minutes and rinsed five times with sterilized water. Seeds were placed in beaker containing sterilized water for 3, 6, 9, 12, 24 and 48 hrs. for imbibition on low temperature incubator (27±2°C). Five replications were taken for each duration. Seeds were reweighed after soaking and percentage of water imbibed was calculated. The imbibed seeds were placed on moist sterilized paper in germinator at 27±2°C along with twenty five unsoaked seeds as control. Observations were made daily for ten days.

The data of percentage germination of seeds of *Cassia fistula* as affected by imbibition period are given

in Table 1. The average maximum imbibition was observed in forty eight hours. Basically imbibition depends on seed size, weight, nature of seed coat and its composition, permeability of covering and others<sup>3</sup>. In control conditions the seeds did not survive. As duration of imbibition increased, the percent germination also increased. Seeds do not resume the physiological activity until they imbibe certain amount of water. Oxygen uptake of seeds increased soon after water is imbibed and respiratory activity generally follows the pattern of water uptake<sup>4</sup>. Moreover, there is optimal substrate water status for maximum percentage germination<sup>5</sup>. Water status not only depends on nature and composition of seed coat but also on imbibition time which alters the various metabolic activities chiefly involving the synthesis of enzymes for gene replication and growth<sup>6</sup>, provided all other factors are not limiting. In the absence of water, the enzymes become inactive. As soon as, the water is absorbed the enzymes become active. The above results are also in confirmation with the studies made by Yadav and Mishra<sup>7</sup> and Tripathi<sup>8</sup>.

**Table 1.** Water absorption (percent of initial weight) and germination percentage of seeds.

Duration of Imbibition	Germination percentage (Values are mean±SE)
3	6±19.24
6	6±23.27
9	6±23.64
12	10±27.68
24	26±32.53
48	26±34.12
Control	00

### References

1. Larson L A and Lwanga K 1969, The effect of prolonged seed soaking on seedling growth of *Pisum*

- sativum*. *Can. J. Bot.* 47 707-709.
2. Chatterji U N and Mohnot K 1968, Ecophysiological investigations of seeds of *Prosopis juliflora* Linn. In: R. Mishra and B. Gopal (Ed.) *Proc. Symp. Recent Adv. Trop. Ecol.* 261-268.
  3. Bewley J D and Black M 1978, Imbibition, Germination and Growth. In: *Physiology and Biochemistry of seeds in relation to germination*. Vol- I Springer verlog Heidelberg., New York.
  4. Kozlowski T T 1971, Seed germination and seedling development. In: *Growth and Development of trees-I* (ed.) Academic Press, New York.
  5. Gupta B N and Kumar A 1977, Interrelated effects of temperature and moisture on seed germination of *Dendrocalamus strictus* Nees. *Ind. For.* 103 (3) 212-219.
  6. Osborne D J 1973, Panel discussion on Pre-sowing seed treatment. In: *Seed Ecology* (ed.) W. Heydecker, Pennsylvania State. Univ. Press Park.
  7. Yadav A S and Mishra G P 1982, Effect of imbibition on gernative capacity in seeds of some tropical dry deciduous forest trees. *Bulletin of the Botanical Society*, Univ. of Sagar, Sagar (M.P.) 29 (1-2) 1-4.
  8. Tripathi J P 1984, Ecophysiological study of *Anogeissus pendula* (Edgew.). Ph. D. Thesis, Sagar Univ., Sagar.