

Studies On Seed Collection, Seed Germination and Ex-Situ Conservation of Some Plants From Gautala Sanctuary

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Abstract

The Gautala sanctuary is reserve for plant biodiversity and wild life situated in Marathwada region dist. Aurangabad Tq. Kannad. The forest is rich in wild and local varieties of plants which are becoming rare due to natural and human activities. It is important to conserve and study the plant biodiversity. In this regard it is decided to collect the seeds of various plants and study the germination percentage and various aspects. The present paper deals with the studies on collection, ex-situ conservation and seed germination of five plants. Seeds were collected during respective seasons and germinated. The overall percentages of seed germination in between 50-80 percent are noted.

Keywords: Ex-situ conservation; Seed collection; Germination with its percentage etc.

Introduction

Gautala sanctuary of Kannad is protected area of Maharashtra state, India. It lies between Satmala and Ajanta hill ranges of Western Ghats. It is wildlife sanctuary established in the year 1986 in an existing reserve forest area. India is rich with flowering plants and having mega diversity in country. Every flowering plant bears seed. Seeds are one of the important parts of the plant. Seed germination is a critical stage of life cycle of plants. According to Z.huang et al.⁷, R.H.Yang et al.⁵ Seed

germination is the critical stage for survival of species. It is rather extraordinary to think that one small seed can grow a tree that will live for many years reaching to several meters in heights. But seed are delicate part to maintain their potential to sprouting for that purpose the seed must be collected, stored and treated properly. There are more than thousands of seed banks in the world for ex-situ conservation of plant diversity. According to D.J. Merritt and Dixon² seed bank collections of wild species will play an increasingly important role in restoration, regeneration of plant species. Ex-situ conservation utilizes proven methods by which seeds are available when need to be used for species recovery. Currently the importance of timing of seed collections to increase seed longevity in storage. Seed germination characteristics to maximize the use of seeds in recovery. The seed and seedlings establishment is one of the initial stages of plant development. The germination process is a specific for each species, depending on different factors like seed maturity, physical

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conditions, harvesting methods Kandari et al.³, V. Gupta⁶. The aim of this present study is to focus on seed collection, ex-situ conservation and seed germination of some plants.

Materials and methods

The mature seeds of five different plants were collected at suitable conditions and stored in plastic containers by using preservative, before storing to check the germination percentage of seeds. The seed of *Albizia lebbeck*, *Aloe vera*, *Bauhinia variegata*, *Cassia fistula* and *Butea monosperma* was used for experiments. The seed germination percentage can be calculated by following formula.

$$\text{Germination percentage} = \frac{\text{Number of seeds germinated}}{\text{Total seeds taken}} \times 100$$

Observations

1. *Albizia lebbeck* (L.) Benth. (Fig. 1a)

Common Name: Shirish

Flowering: March-May

Family: Fabaceae

Fruiting: July-February

Habitat: It is commonly found in dry deciduous forest, also planted along the roadsides. It is tall tree; the leaves are bipinnate, 15cm long with 1-4 pairs of pinnate. Flowers are white yellow with numerous stamens and very much fragrant.

Seed Morphology: The seeds of this plant are macroscopic 0.7-1.0 x 0.5-0.7 x 0.1-0.4cm, oblong ovate, compressed, seed coat is hard, and seed surface is smooth. (Fig. 1b)

Seed Germination: Seed germinate within 7-15 days and germination capacity is about 80%. (Fig. 1c)

2. *Aloe vera* (L.) Burm.F. (Fig. 2a)

Common Name: Korpad

Flowering: December-February

Family: Asphodelaceae

Fruiting: March-May

Habitat: It is a stem less plant, very short stem, leaves are thick and fleshy. It is cultivated for its commercial products such as skin lotions, beverages, ointments, cosmetics and also used for digestive juice; gel is also made from succulent leaves etc. Flowers are yellow to orange fruit dehiscent

capsule.

Seed Morphology: The seeds of this plant are macroscopic 5-9 x 2.0-5cm. Seed coat is thin transparent papery, surface of leaf is scaly. (Fig. 2b)

Seed germination: Seed germination takes place within 12-20 days and germination percentage is 18-25%. (Fig. 2c)

3. *Bauhinia variegata* L. (Fig. 3a)

Common Name: Kanchan, Kanchana

Flowering: November-January

Family: Fabaceae

Fruiting: January-March

Habitat: It is a small medium sized tree growing up to 15 meters in height. The bark is light brownish to grey. The flowers are variegated to white or purple coloured very much attractive arising terminally or auxiliary in position. Mostly auxiliary racemes or corymbs, fruits are dry dehiscent, pods 10-16 seeded, oblong hard and flat in structure.

Seed Morphology: The seeds of plant are macroscopic 1.1-1.5 x 1.0 x 1.4 x 0.1-0.2 cm. flat, orbicular, slightly pointed tip, seed coat is hard, oval slit, surface is smooth to rough with pointed tip. (Fig. 3b)

Seed germination: Seed germination is near about 80% and takes 25-35 days. (Fig. 3c)

4. *Cassia fistula* L. (Fig. 4a)

Common Name: Bahava (Golden shower tree)

Flowering: April-June

Family: Fabaceae

Fruiting: May-January

Habitat: It is one of medium sized deciduous or semi-deciduous tree. Near about 10-15 meter tall. The branches are spread to form an open crown. The stem is with bark which is smooth and slender and rough when it is old. Flowers are yellow in colour raceme; it is also called as golden shower tree due to its attractive flowers. Fruit is indehiscent legume nearly about 30-80 seeded elongated pendulous. The legume has pungent odor and containing several seeds. The tree has hard durable wood.

Seed Morphology: Seeds are macroscopic 7.1 -9.2 x 6.0-7.1 x 2.3-3.4 mm, obcordate compressed usually flat, seed coat is hard, surface is glossy sometimes scalariform striations along margins or all over surface etc. (Fig. 4b)

Seed germination: seed germination period is 50-7 %.(Fig. 4c)

5. **Butea monosperma L. (Fig. 5a)**

Common Name: Palas or palathi

Flowering: December-March

Family: Fabaceae

Fruiting: April May

Habitat: It is small sized tree growing up to 15 meter. The leaves are pinnate with 8-15 cm long petiole, it is trifoliolate. The flowers are bright orange red produced in raceme.

Fruits are indehiscent pods. Single seeded, oblong or broadly linear.

Seed Morphology: Seeds are macroscopic 2.4 -3.4 x 2.0-2.5 x 0.1-0.3 cm, reniform, compressed, seed coat is thin, vertically veined, rugose, surface glossy. (Fig. 5b)

Seed germination: seed germination takes about 25-65 days and percentage of germination is above 70%. (Fig. 5c)

Result and discussions

The present study concerning with collection and conservation of seeds with seed germination percentage of five different plants were evaluated. The seeds are collected from natural habitats the ample seeds of plants were taken and count the percentage of seed germination A. Raghav et al.¹ and M. Thirupathi et al.⁴

Table 1: Showing germination percentage of the plant species.

Sr. No.	Name of plant	Germination percentage	Days require
1	Albizia lebbeck (L)Benth.	80 %	7-15
2	Aloe vera (L)Burm .F.	18-25%	12-20
3	Bauhinia variegata L.	80 %	25-35
4	Cassia fistula L.	50-70 %	50-75
5	Butea monosperma L.	70 %	25-65

In above studied plants the seed germination percentage is near about 70-80% recorded. The lowest percentage noted in Aloe vera and highest

percentage of seed germination noted in Albizia lebbeck and Bauhinia variegata.



Fig. 1a: Albizia lebbeck, **Fig. 1b:** Seeds of A. lebbeck, **Fig. 1c:** Germination of A. lebbeck

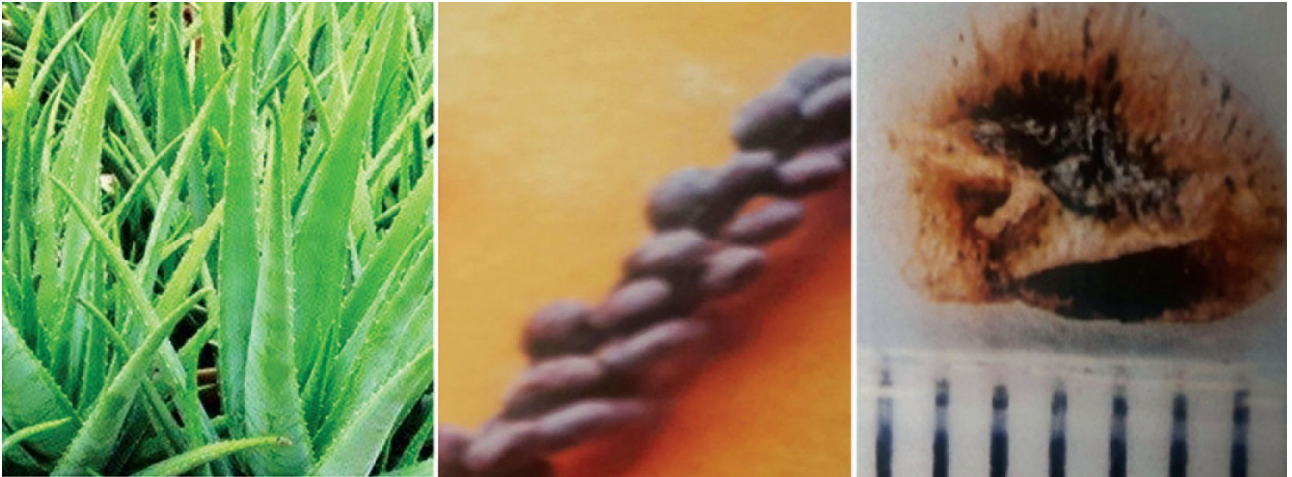


Fig. 2a: Aloe Vera, Fig. 2b) Seeds of A. Vera, Fig. 2c) Germination A. Vera



Fig. 3a: Bauhinia variegata, Fig. 3b) Seeds of B.variegata, Fig. 3c) Germination B.variegata



Fig. 4a: Cassia fistula, Fig. 4b) Seeds of C. fistula, Fig. 4c) Germination C. fistula



Fig. 5a: *Butea monosperma*, Fig. 5b) Seeds of *B. monosperma*, Fig. 5c) Germination *B. monosperma*

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