

**Study the characteristics and nature of the Indian dates tree.
Tamarindus Indica L
In the southwestern region (Jizan and Asir)**

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Key words: Seed germination, *Tamarindus indica* L

Running Title: Seedlings performance of *Tamarindus indica* L.

introduction

The Indian dates trees L. *Tamarindus Indica* are normal in the southwest of the Kingdom of these species threatened with extinction, as there is a gradual decrease in their numbers and are scattered in small groups or in the form of isolated plants. It should be preserved in its natural spread places to maintain biological diversity in those areas.

Introduction

Tamarindusindica L., a tree belongs to the family Fabaceae, sub-family Caesalpiniaceae (Lewis *et al.*, 2005). It belongs to a monotypic genus, containing one species, *T. indica*(El-Siddiget *al.*, 2006). The tree is 15-20 m high, with hemispheric crown and rugose grayish trunk (Avilán *et al.*, 1992). The tree is native to tropical Africa (Morton, 1987, Grolier *et al.*, 1998) and it is widely cultivated at present in tropical and subtropical regions due to the nutritional value of its fruits for humans and its foliage for animals, as well as for the beauty of its parts, that grant it the category of ornamental and shade tree (De Oliveira, 2006). The wood is hard and useful as fuel and for cabinetwork (Dalla, 1993). The principal product of *T. indica* is the pulp which is used as an ingredient in cooking and juices contains sugars, organic acids and vitamins (NAS, 1979). The drink made from tamarind is particularly popular among Muslims during the period of fasting (Onuora and Usman, 2004), probably due to its laxative properties. Seeds, leaves, and flowers are also used in human nutrition, and various products of the species have pharmaceutical properties (De Caluwe *et al.* 2010). However, *T.indica* seeds do not germinate when placed under conditions which are normally regarded as favorable for germination and it may need some special treatments that induce germination. Seed dormancy is regarded as the failure of an intact viable seed to complete germination under favorable conditions and it has been the subject of numerous studies. Germination incorporates those events that commence with the uptake of water by the quiescent dry seed and

terminate with the elongation of the embryonic axis (Bewley and Black 1994). The visible sign that germination is complete is usually the penetration of the structure surrounding the embryo by the radicle, the result is often called visible germination.

There are many types of seed dormancy. These include: dormancy imposed by hardness of seed coats or impermeability of tegument; dormancy induced by presence of inhibitors; conditions of light; and dormancy due to embryonic immaturity (Eira 2000). The first and the last dormancy types were found in the seeds of *T. indica*. The germination of dormant seeds of *T. indica* is slow and not uniform as the conditions necessary for terminating their dormancy under natural conditions take a long time to achieve. Despite the fact that many researchers in physiology study dormancy, there is still limited information about the dormancy types and the seed germination of *T. indica* considering the high economic values of these tree seeds.

On the other hand, planting medium plays a significant role in seedling emergence and necessary for the growth and development of a plant. It provides the basic necessities required by the plant throughout its life. In general, seedling and cuttings are grown in various types of soils due to which the root environment is significantly affected by the physical and chemical properties of the media used. According to Larson (1980) the best planting media must have a pH conducive to plant growth, a structure that will permit gaseous exchange to provide aeration for the root and permit water infiltration and movement. The texture or particle size distribution of nursery soils and that of potting medium for containerized planting stock is an important soil physical property influencing root and shoot growth and have a profound effect on the supply of water and air to the growing plant (Baiyeri, 2005). Although propagation of indigenous tree species from seed is inexpensive and usually effective, the germination requirements for native species are often unknown.

The first objective of the present study is to improve the germinability methods of the *Tamarindus indicaseeds* by using various treatments that could induce germination and terminate dormancy within the shortest period of time. The second objective is to find out the suitable germination media to maximize seed germination and seedlings growth in order to produce quality seedlings for farmers and reforestation plans.

Objectives of the study

Learn about the gender of Indian dates by studying the characteristics and nature of its growth in its natural environments

Work methods:

Study site

- The study covered the Asir and Jazan regions.

Action steps

- Tamarind trees have been located in each area .
- The specifications of each site in terms of altitude and coordinates were recorded using the (GPS) system .
- Climate analysis was done using the Emberg equation for climate analysis:

2000 P

$$Q^2 = \frac{P^2}{M^2 - m^2}$$

$$M^2 - m^2$$

Whereas:

Q = Thermal rain coefficient.

P = Average annual rainfall in mm.

M = Average Celsius temperatures for the hottest month.

m = Average Celsius temperatures for the coldest month.

Indian dates trees growth properties

• Samples of developing trees were chosen in three selected locations from each region and determined the density of the tree cover in each site.

• The height of the trees was measured by metric stature and the leg diameter using the metropolitan

• The length of the leaves and the number of paper were measured.

• Flowers, contract and fruits were followed up.

Characteristics of fruits and seeds

• Glossed samples of fruits.

• A random sample was taken from ripe fruits.

• Ripe fruits and color were described, measuring the length and width of the fruits and seeds with a digital introduction.

The pods were dried and the seeds were extracted from them.

• The number of seeds in a kilogram was estimated as follows:

Number of sample seed

$$\times \frac{\text{Sample seed weight in grams}}{1000}$$

Sample seed weight in grams

• The purity of the seeds was calculated as follows:

Pure seed weight

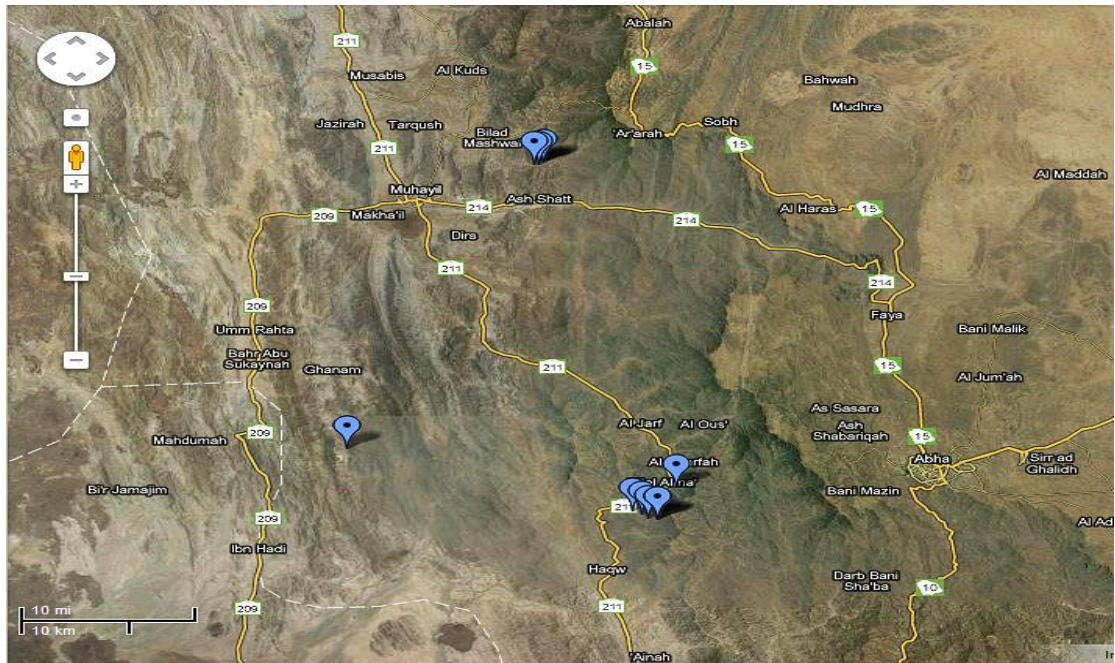
$$\times \frac{\text{Total weight of the sample}}{100}$$

Total weight of the sample

Study Locations in Jazan Region



Study Locations in Asir Province



Comparison of tree height and diameter between different sites in the two study areas:

Region	Site	Height (m)	Leg diameter (m)
Jazan	Wadi Qusai	17.50 a	0.81 a
	Wadi Atwan	14.32 a	0.57 a
	Wadi Bani Malak	14.15 a	0.63 a
Asir	Wadi Marra	12.83 ab	0.45 b
	Wadi Rajab	12.70 ab	0.52 a
	Rijal Almae	8.84 b	0.45 b

Comparison of diameter and height of growing trees at the study site:

Site	Average leg diameter at chest level (m)	Average height of trees (m)
Asir	0.47 b	11.81 b
Jazan	0.64 a	14.99 a

Virtual description of the tamarind tree:

- The tamarind tree is evergreen and has a rounded crown
- Its average height is about 14 meters and its average diameter is half a meter.
- The color of the stem and branches is tanned and the texture of the stem is rough.
- The leaves are compound pinnate consisting of 13.12 ± 2.2 leaflets.
- Leaf length to about 7.9 ± 1.5 cm.
- Leaflet length 1-1.5 cm .
- The flowers are irregular, 1.5 cm long and 2-2.5 cm in diameter, and are colored red veined yellow
- Fruits are straight or curved pods and curled.
- Seeds are semi-oval or usually irregular in shape and brown in color.



• **Flowering phase, knots and fruiting**

Stage	Date
Beginning of flowering	From the first of May to the middle of June
Flowering completion	From mid-June to mid-July
Fruit contract	From mid-July to mid-August
Fruit ripening	From the first of October to the end of December

• **Length and width of the fruit and seed**

Region	Average fruit width (mm)	Average fruit length (mm)	Average seed width (mm)	Average seed length (mm)
Jazan	24.22±7.2	74.04 ± 16.4	8.8 ± 0.73	11.58 ± 0.47
Asir	19.86 ± 2.9	69.78 ± 18.6	8.55 ± 1.1	12.07± 1.15
Overall average	22.04	71.91	8.67	11.52

Conclusions

. The prevailing climate in the study area is arid in Asir and very dry in the Jazan region.

- Trees with large diameters and high altitude, which indicates their old age and old age, and there are no young and young trees.
- The tamarind tree growing in the southwestern region of Saudi Arabia is an evergreen tree that is huge in size compared to the rest of the trees spread in this region.
- Flowering began in mid-May, flowering was completed in mid-July, then fruits began to form in mid-August, and the fruiting phase was completed in December.

Recommendations:

- Conducting a survey with the concerned authorities on the rest of the Kingdom's regions to find out their spread.
- Rehabilitation of tamarind trees at the study site by protecting these trees in their natural sites through seeds and cuttings.

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