



ORIGINAL ARTICLE

## **Growth and Development of an Endangered Medicinal Plant *Karanjava Caesalpinia bonduc* (Linn.)Roxb. in District Meerut (U.P.)**

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### **ABSTRACT**

The present study was carried out in District Meerut for the period May to December, 2013. *Caesalpinia bonduc* is highly valued plant for the people. Hence, there is an urgent need for conservation of this plant. The mature, dried and healthy seeds of *Caesalpinia bonduc* were collected from Naryanganj, District Jabalpur, Madhya Pradesh. A total of 100 seeds were sown in 10 cemented (80 kg) pots containing 3:1 soil: manure ratio. After six days, germination commenced. In the month of May and June, 100% germination was observed within 21 days while in the month of July, 100% germination was observed within 15 days. After 120 days, old samplings were transplanted into the fields of urban and rural areas of District Meerut. The results indicate that the status of germination and development of all the stages of *Caesalpinia bonduc* is fairly rapid. The older plants were growing two or more meter per year. It is concluded that the aim of the present study is to spread awareness towards the conservation of the endangered medicinal plant *Caesalpinia bonduc* and environmental management in those areas where the plant is now rarely found.

**Key Words:** - *Caesalpinia bonduc*, Endangered, Conservation

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### **INTRODUCTION**

*Caesalpinia bonduc* is an important medicinal plant extensively distributed throughout India, Burma, Sri Lanka, and Africa and in other tropical and subtropical regions of the world. It is an endangered plant species which belongs to the family Caesalpinaceae, which is commonly known as Karanjawa. Meerut's soil is more fertile and has a warm subtropical climate and becomes very cold and dries in winters from December to mid February while it is dry and hot in summers from April to June. During extreme winters, the maximum temperature is around 12<sup>o</sup> and minimum 3<sup>o</sup> to 4<sup>o</sup> Celsius. Summers can be quite hot with temperatures rising upto 40<sup>o</sup> to 42<sup>o</sup> Celsius range. *Caesalpinia bonduc* is perceived as very important for local populations and this species is threatened by *overexploitation* of its roots, which are mainly used against prostate gland disease in traditional pharmacopoeia. In India, the *Caesalpinia bonduc* is used for medicinal treatment such as: plant leaves used in memory weakness, painful menstruation and malaria diabetes while young shoot used in toothache and gum bleeding. Flowers of this species are the sources of nectar for honey bees, xylocopa, butter flies and also used for hair growing and control hair fall. The oil from the seeds is used in convulsions and paralysis. Plant roots of this species are also used in various ailments such as: sexual weakness, hernia, prevention of prostate gland disease and chicken pox. Further, unscientific overexploitation of the plant like using seeds and bark for medicinal purposes and destruction of habitat by anthropogenic activities push this species towards the threshold of threatening conditions. If proper steps are not taken for conservation, it will become extinct. According to the World Health Organization (WHO), 80% of the world's population depends on traditional medicines for their primary health care needs. Urban and rural vegetation are playing important role in various sustainable environment management policies. Public gardens, avenue arboretum and terrace gardens are the natural habitats with countable potential to conserve medicinal plant species. *Caesalpinia bonduc* can play an important role in the biodiversity of the forests, protection of the soil and furnishing cover for wildlife. The seeds have been used from centuries and are still used in jewellery, prayer beads, good luck charms, and

worry stones. The seeds are found on beaches in northern Scotland and are known to be able to float in sea water for as long as 19 years [1]. Burnt seeds with alum are good dentifrice useful in spongy gums and gum boils and its fresh fruit powder is used in fever. The juice of leaves is anthelmintic, good in elephantiasis and small pox diseases. In disorders of liver, the tender leaves are considered very efficacious and flowers ash is used as cures. *Caesalpinia bonduc* root-bark is good for tumour and removing the placenta. The root bark powder with honey finds use in the cases of hernia. *Caesalpinia bonduc* grows in full sun shade but withstand areas with partial shade [2]. It tolerates salt spray, saline soils and occasional flooding with seawater. It can grow in a wide range of soil pH from mildly acidic to alkaline soils. *Caesalpinia bonduc* is commonly found in beach vegetation on coastal dunes with better-drained edges of mangrove forest, but also grows inland in disturbed areas. The species is sometimes planted as hedge to prevent undesired entry into property and can be planted for dune stabilization. Preparations of the seeds and other parts of the plant are used to treat a large range of ailments. Hence, there is an urgent need for conserving endangered plant which is required in Meerut and many other adjacent Districts. The present research work consisted in defining conservation and development increases the availability of shrub *Caesalpinia bonduc*.

### MATERIAL AND METHODS

The present study was carried out at B - 16, Jwala Nagar, Ambedkar Chowk in District Meerut for the period May to December, 2013. The mature dried and healthy seeds of *Caesalpinia bonduc* were collected from Naryanganj, District Jabalpur, Madhya Pradesh in the month of March, 2013. Total 100 seeds were sown in 10 cemented (80 kg, each pot size, 75x60) pots containing 3:1 soil: manure ratio. After six days, germination commenced and 100% germination was observed within 21 days in the month of May and June while, 100% germination was observed in the month of July within 15 days. After completion of 120 days, old samplings were transplanted into various fields of urban and rural area of Meerut District. The older plants grew two or more meters per year.

### RESULTS AND DISCUSSION

The result shows that the total seeds germinated 100% in the month of July within 15 days while in the month of May and June 100% germination was observed within 21 days. Seedlings reached 27.56 mean cm in 30 days, 62.26 cm in 60 days and 100.4 cm in 90 days while, 110.36 cm in 120 days and the girth size also observed increase by 1.1 cm, 2.3 cm, 3.4 cm and 5.1 cm in 30, 60, 90 and 120 days respectively. Growth of all stages of *Caesalpinia bonduc* is fairly rapid in rural and urban areas of Meerut District. The older plants were growing two or more meter per year. As a consequence, many plants species are threatened and disappear more and more from their natural ecosystems (Adomou et al., 2005). The present study focuses on the endangered scrambling shrub (*Caesalpinia bonduc*), a multipurpose plant with species having medicinal properties [3-6].

**TABLE - 1: Total Seed Germination during May to July**

MAY							
Days	3	6	9	12	15	18	21
Germination (%)	-	-	20	50	70	80	100
JUNE							
Days	3	6	9	12	15	18	21
Germination (%)	-	-	40	60	80	90	100
JULY							
Days	3	6	9	12	15	18	21
Germination (%)	-	20	40	70	100	-	-

**TABLE 2. The Plant Shoot, Root Length and Girth Size At 30, 60, 90, And 120 Days After Seed Sowing.**

Days	Plant Height (Cm)	Girth Size (Cm)
30	27.56±0.30	1.1 ± 0.1
60	62.26±0.25	2.3 ± 0.1
90	100.4±0.17	3.4 ± 0.47
120	120.46±0.15	5.1 ± 0.25



**Fig 1.** Seeds collected from Narayana Ganj, Ja-halpur



**Fig 2:** Seeds of *Caesalpinia bonduc*



**Fig 3** Unsacrificed seed germination 6 days



**Fig 4.** Seedling of *Caesalpinia bonduc*



**Fig 5.** Germination of *Caesalpinia bonduc* seeds



**Fig 6.** 15<sup>th</sup> days growth of *Caesalpinia bonduc* (after seeds sowing)



Fig. 7. Plantation in Village Godka, Meerut



Fig 8. Plantation in Sanjay van, Meerut



Fig. 9. 30 days growth of *caesalpinia bonduc* 20 kg pot (after seeds sowing)



Fig 10. 120 days growth of *caesalpinia bonduc* in 80 Kg soils pot (after seeds sowing)

## CONCLUSION

It is concluded that the aim of the present study is to spread awareness towards conservation of endangered medicinal plant *Caesalpinia bonduc* and environmental management in those areas where the plant is now rarely found. This research work will also prove to be of immense usefulness for the conservation of endangered *Caesalpinia bonduc* species in the forest. Since this plant is beneficial for humans in many ways, therefore it is required that wide propagation and conservation of this plant should be carried out, in order to ensure that future generations can benefit from it.

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