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Research Note

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Standardization of propagation methods of Chironji (*Buchnania lanzan* Spreng)

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ABSTRACT : Chironji, a multipurpose tree provides food, fuel, fodder, timber and medicine to the local community. It is free for collection, as a result of which the local inhabitants, traders and greedy merchants destroy the branches/whole trees during collection of its fruits without bothering about new plantations. This has led to the destruction of Chironji plants in the forests. The seed germination studies were conducted in the nursery of Krishi Vigyan Kendra, Dantewada. For studies on plant survival and growth, fresh seeds of *B. lanzan* were planted in the field in silty-loam soil. Seed germination of 75 per cent within 20 days could be achieved with satisfactory seedling growth by mechanically damaging the stony endocarp with hammer before sowing followed by seed treatment with 5 per cent H_2SO_4 that is 61.5 per cent within 25 days and only 39 per cent germination were recorded in seed sown normally.

KEY WORDS : Chironji, Germination, Non-timber forest produce, Propagation

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Dantewada district, a part of the Bastar zone, is one of the most backward districts of Chhattisgarh. Most of the people in this district belong to tribal communities. Their major sources of income are farming and collection and selling of minor forest-based products. Major crops are rice and finger millet, but due to the lack of irrigation facilities, agriculture depends entirely on the monsoon leading to poor productivity of crops. Collection and selling of minor forest based produce; especially Chironji (one of the important multipurpose forest species) brings income to the local inhabitants. Chironji (*Buchnania lanzan* Spreng syn. *B. latifolia* Roxb), also known as Char, Piyal or Achar belongs to the family Anacardiaceae. It is a subtropical, underutilized/ underexploited nut fruit and is considered to be native to India.

This multipurpose tree provides food, fuel, fodder, timber and medicine to the local community. It is a popular and edible nut fruit, eaten raw or roasted and also used in making dessert. During summer when green fodder becomes unavailable, local inhabitants use its leaf as green fodder for their animals, especially buffalo, goat and sheep. Its dried wood is utilized as a fuel. The timber of Chironji is slightly resistant to termite and is utilized for making furniture, boxes and crates, desks, fine furniture, match boxes, mill work, moulding, packing cases, stools, tables and agricultural implements. Some parts of the plant are also used to cure diseases, for instance roots in diarrhoea, leaves for skin diseases and healing wounds, gum/ resins in diarrhoea, and fruits in asthma and cough. Locals also earn money by collecting gum/resins and lac by rearing kussumi strain of lac on the chironji tree. The nutritional value and physico-chemical properties of Chironji are given in Table 1.

Problem identified and future research area:

At present the plant is grouped as an underexploited and non-nationalized minor forest produce. It is free for collection, as a result of which the local inhabitants, traders and greedy merchants destroy the branches/whole trees during collection of its fruits without bothering about new plantations. This has led to the destruction of chironji plants in the forests. There is an urgent need to develop a technology for easy multiplication and regeneration of Chironji, and to popularize its importance among local inhabitants/tribal's. The tree is propagated from seeds which are contained inside a hard shell. Before sowing, challenging task is to crack the shell carefully, as the fruit inside it is often extremely soft and tender. It grows

Table A : Nutritional value and physio-chemical properties of Chironji

Physio-chemical properties	Fat (mg)	Protein (%)	Starch (%)	Calcium (mg)	Phosphorus (mg)	Iron (mg)	Thiamine (mg)	Vitamin C (mg)	Niacin (mg)	Oil (%)
	59.0	63-72	12.1	279	528	8.5	0.69	5.0	1.5	34-47

(Gopalan *et al*,.1982)

Table 2 : Influence of scarification on seed germination and seedling growth of Chironji

Sr. No.	Treatments	Germination (%)	Days taken to germination	Plant height one month after germination of seed (cm)	Survival percentage one month after germination (%)
T_1	Control (Without treatment)	39 .25	29.25	2.30	79.50
T_2	Soaking of seeds in water overnight	42.25	28.50	2.32	80.25
T_3	Scarification by hot water treatment	47.50	24.50	2.40	85.25
T_4	Scarification by H_2SO_4	61.50	25.00	2.75	88.00
T_5	Scarification by hammer	75.00	20.00	3.07	90.00
	S.E. (m) $\pm$	0.87	1.02	0.06	1.32
	C.D. (P=0.05)	2.73	3.19	0.19	4.12

moderately fast and tolerates drought too! Though in earlier times, the forests were full of them, now they are facing mass destruction.

An experiment was carried out at Krishi Vigyan Kendra, Dantewada (South Bastar) IGKV, Raipur, Chhattisgarh during 2013-14. The Soil of the experimental site is silty-loam and pH of the soil ranging from 5.5 to 6.1. Four raised beds of 10m x 1m x 0.15m size were prepared and well decomposed FMY was properly mixed into top soil of the bed @ 50 kg/bed and 1.0 kg of NPK/bed. Each raised bed consisted of five plots for accommodation of five treatments and in each plot 100 seeds of the treatments were used. The seeds were sown 2-3 cm deep in the nursery bed. The experiment was laid in Randomized Block Design with five treatments and four replications. The treatment details are given below:

T_1 : Seed sown normally
T_2 : Soaking of seeds in water overnight
T_3 : Mechanical rupturing of seed coat by hammer before sowing of seeds
T_4 : Hot water treatment at 50^0C for 30 minutes
T_5 : Seed treatment by 5% H_2SO_4 for 10 minutes.

The biometric observations were recorded on germination percentage, days taken for germination, plant height (cm) one month after germination of seed and survival percentage one month after germination of seed. The data collected from different characters were processed and were analyzed by the method of analysis of variance given by Gomez and Gomez (1984).

The treatment mechanically rupturing of stony seed coat with hammer before sowing of seed recorded the highest percentage of germination (75.00 %), taken minimum days for germination (20 days), highest seedling growth (3.07 cm one month after germination) and highest percentage of plant survival (90.00 %) one month after germination, which was statistically superior and showed significant difference from rest of the treatments (Table 2). The treatment mechanically rupturing of seed coat by hammer recorded the increased percentage of germination, plant height and survival percentage (91.08 %, 33.4% and 13.2 %, respectively) over the control (sowing of seeds without treatment). The control treatment recorded the lowest germination (39.25 %), plant height (2.30 cm), plant survival (79.50 %) one month after germination and taken longest days (29.25) for the germination of seed.

Shukla and Solanki (2000) also recorded the seed germination of 83 per cent within 18 days with satisfactory seedling growth by mechanically damaging the seed coat with hammer before sowing of seed. Centre of Forest Research and Human Resource Development, Chhindwara (Annual Report, 2005-06) also reported that the seed of *Buchnania Lanzan* treated mechanically by hammer gave better germination and seedling growth.

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