Nutraceutical potential & value addition of "Lasoda"	RASHTRIYA KRISHI	Volume 15	Issue 2	December, 2020	7.
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ISSN-0974-0759 |

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Nutraceutical potential and value addition of "Lasoda" (Cordia myxa L.)

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Lasoda, scientifically known as *Cordia myxa* L., is a minor and underutilized fruit of nutritional importance and is popularly eaten by people since ancient times. It is commonly known as Indian cherry, lehsua or goonda, belongs to family Boraginaceae and is grown all over India except in high hills. The origin of the fruit tree is suspected to be from the eastern Mediterranean region to eastern India. In India, it is mostly found in the northern part and is abundantly distributed and naturally growing in the northwestern region (Sivalingam *et al.*, 2012). Almost all parts of lasoda are used for various purposes.

Synonyms: The most popular species available are as follows:

- Cordia gharaf (goondi)
- Cordia rothii
- Cordia macleodii
- Cordia vestita
- -Cordia wallichii.

Lasoda is a fairly fast growing, evergreen tree and behaves like a deciduous tree during unfavourable environmental conditions. The tree is medium in size, having dense foliage with crooked trunk and attains a height

of 15 m (Pareek and Sharma, 2009). Bark is grayish brown with longitudinal and vertical fissures. Young shoots are silvery-grey with hairs. Leaves are simple, broadly ovate or sub-orbicular rounded-cordate, alternate, 3–5 nerved, 7–15 cm long. "Lasoda" tree flowers during March–April. Flowers are bisexual, small, white, usually pentamerous and borne on large lax terminal and axillary

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cymes. Fruits are formed soon after flowering and ripen during May–July. Fruit is drupe, 1–3 cm long, yellowish brown and pink at ripening. The pulp is sweet, viscid and transparent surrounding the stone (Barraso *et al.*, 2009). These are harvested and used as vegetable and in pickles. Ripe fruits are freshly eaten; they are rich source of carbohydrates. The yield of fruits is 30-50 kg of fruits. From the economic point of view, Cordia myxa is very important woody plant. The fresh foliage and tender twigs are very useful for fodder of cattle. The extract of leaves is used to cure cough and urinary disorder (Ahirwar, 2013). Fruits are considered as one of richest natural sources of

> antioxidants *i.e.* carotenoids, ascorbic acid, phenols etc. Fruits are important sources of minerals, fibre and vitamins, which provides essential nutrients for the human health (Mala, 2009). The most important nutrients present in plants are carbohydrates, such as the starch and free sugars, oils, proteins, minerals, ascorbic acid and the antioxidant phenols, such as chlorogenic acid and its polymers (Spiller, 2001 and Gupta *et al.*, 2018).

Nutraceutical potential: Studies conducted at ICAR-CIAH, Bikaner has shown that the lasoda fruits are good source of different antioxidants, which are presented hereunder.

Several chemicals have been identified from seeds of *C. myxa* L. The seed contains α -amyrins, betulin, octacosanol, lupeol-3 rhamnoside, β -sitosterol, β -sitosterol

Table 1 : Antioxidant attributes of lasoda (Hare et al., 2019)						
Sr. No.	Attributes	Contents				
1.	Polyphenols (mg/100g)	137.56				
2.	Flavanol (mg/100g)	14.32				
3.	Flavonoid (mg/100g)	434.28				
4.	0-dihydric phenol (mg/100g)	45.67				
5.	Total AOX activity (MTE/100g)	10.67				

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3 glucoside, hentricontanol, hentricontane, taxifolin-3-5dirhamnoside, hesperitin-7-rhamnoside and fatty acids such as palmitic acid, stearic acid, arachidic acid, behenic acid, oleic acid and linoleic acid. Four flavonoid glycosides (robinin, rutin, rutoside, datiscoside and hesperidin), a flavonoid aglycone (dihydrorobinetin) and 2 phenolic derivatives (chlorogenic acid and caffeic acid) were isolated from seeds. The significant anti-inflammatory activity of seeds is because of α -amyrins and taxifolin-3-5-dirhamnoside (71.4%, 67.8% respectively). The seeds also contain fatty acids and flavonoids. The bark is medicinal and contains several chemicals including allantoin, β -sitosterol and 3,5-dihydroxy-4'- methoxy flavanone-7-O-alpha-L-rhamnopyranoside. Fruits and leaves showed presence of pyrrolizidine alkaloids, coumarins, flavonoids, saponins, terpenes and sterols. Fruit has been identified for arabinoglucan, D-glucose (67.6%) and L-arabinose (13.2%). Leaves also contain quercetin and quercitrin (Jamkhande et al., 2013).

Value addition: Value added products will definitely help to provide taste throughout the year if processed during the season. It will not only help the growers to get good returns but also provide nutritionally and medicinally rich value added products for the consumers. Lasoda are not utilized as table fruit because of high acidity, strong astringent taste and also difficulty in eating. Thus, lasoda can be converted into value added processed products like pickles, chutney, vegetable etc. There is good demand not only in domestic market but also in international trade for new food products, especially, which are highly nutritious and delicately flavoured (Hare et al., 2019). The sweet mucilaginous pulp may be eaten fresh while fruit cover and seeds are discarded. People in Maharashtra prepare the young inflorescence into a vegetable while those in Alaknanda Valley, Garhwal; Himachal Pradesh, Chhattisgarh and Gujarat, tribes in Ahmednagar and Kolhapur districts of Maharashtra, Bastar and Mandala district of Madhya Pradesh use leaves as vegetable. **References:**

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Revised : 11.11.2020

Accepted : 18.11.2020

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Received : 24.09.2020

Rashtriya Krishi | Vol. 15 (2) | Dec., 2020 📃