

The First Variety of Tumba:

'Mansha Marudhara' ('RMT 59') released

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'Mansha murudhara' ('RMT-59') is a tumba variety, developed at ARS, Mandor, Jodhpur of Rajasthan Agriculture University, Bikaner by All India Coordinated Research Network on Underutilized Crops, NBPGR, New Delhi and released by Central Sub-committee on Crop Standards, Notification and Release of variety during 2005 for high seed yield and fruit yield for Rajasthan and Gujarat region. *'Mansha murudhara'* is indigenous selection from local collection 'GP-59' from Rajasthan region. The seed yield, no. of fruits per plant and protein content in defatted seed cake has been observed to be superior in this variety than the all other genotypes. Variety gave consistently high yield and No. of fruits per plant over other genotypes at various centres.

Tumba (*Citrullus colocynthis*) is a monoecious herb with perennial roots and defuse or creeping stems which are angled, branched and scabrid. Its tendrils are simple or rarely bifid, slender and hairy. Its leaves are variable as 2.5-5 cm in the wild form and 3.8-6.3 cm of the cultivated crop. The leaves are usually deltoid in outline and pale green in colour. Its calyx is hairy, campanulate and 5 mm in length. It has female flowers. Its ovary is ellipsoid and densely hairy. Its fruit is globular, slightly depressed and 5.0-7.5 cm in diameter. It is variegated green and white. It is glabrous when ripe, filled with a dry spongy bitter pulp and thin epicarp.

The native to dry areas of north Africa, it is common throughout Sahara, areas of Morocco, Egypt and Sudan, eastward through Iran to India and other parts of tropical Asia.

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It has been known since Biblical times and cultivated in the Mediterranean region, especially in Cyprus and in India for many centuries. Ranging from cool temperate moist through tropical desert to Wet Forest Life Zones, colocynth is reported to tolerate annual precipitation of 38 to 429 mm, annual temperature 14.8 to 27.8°C and pH 5.0 to 7.8. A highly xerophyte, it thrives well in sandy

loam, sub desert soils and along sandy sea coasts. In India, it is estimated to be grown in about 1.5 m ha mostly in wild form, sporadically in cultivators' fields, waste lands, fallow marginal and sub marginal tracts giving on an estimate produce of about 2.24 million q seed, of when > 50% is fed to cattle and rest arriving at milling units.

Medicinally it is used for diseases like tumours, ascites, leucoderma,

Table 1. Mean seed yield (q/ha) of tumba genotype tested for four years

Genotype	2000		2001		2002		2003		Mean	Rank	Frequency of superiority over trial mean	%age increase/decrease over trial mean
	Mandor	S.K. Nagar	Mandor	S.K. Nagar	Mandor	S.K. Nagar	Mandor	S.K. Nagar				
'GP-3'	1.42	2.12	1.46	2.50	1.32	2.08	1.35	2.14	1.80		0/8	-19.28
'GP-59'	2.46*	3.80	2.51*	2.36	2.09*	2.97	2.43*	1.92	2.57	I	4/8	15.25
'GP-119'	2.37*	3.70	2.33*	2.78	1.79	2.34	2.25*	2.08	2.46		3/8	10.31
'GP-172'	1.72	3.60	1.75	2.19	1.52	1.86	1.67	1.85	2.02		0/8	-9.42
'GP-181'	1.42	3.18	1.41	2.36	1.20	1.41	1.41	1.78	1.77		0/8	-20.63
'GP-183'	2.13	3.54	2.14*	2.08	1.92	2.25	2.07	2.40	2.32		1/8	4.04
'GP-194'	2.30	3.77	2.32*	3.06*	2.13*	1.65	2.19*	1.67	2.39		4/8	7.17
'GP-285'	2.25	3.92	2.30*	2.72	2.11*	3.33	2.12	1.76	2.56	II	2/8	14.80
Mean	2.01	3.45	2.03	2.51	1.76	2.24	1.94	1.95	2.23			0.00
CD (0.05)	0.31	1.04	0.07	0.29	0.18	0.85	0.21	0.85				
CV (%) Error	4.80	14.00	5.94	5.38	5.99	26.59	19.91	24.21				

* Significant at 5%

Table 2. Number of fruits/plant of tumba genotype tested for three years

Genotype	2001		2002	2003		Mean	Rank	Frequency of superiority over trial mean	%age increase/decrease over trial mean
	New Delhi	S.K. Nagar	S.K. Nagar	Mandor	S.K. Nagar				
'GP-3'	15.75	39.25	44.00	22.80	49.50	34.26		0/5	-3.90
'GP-59'	18.67*	48.25*	53.00*	34.00*	47.75	40.33	I	4/5	13.13
'GP-119'	17.01	45.25	46.00	33.00*	48.25	37.90	II	1/5	6.31
'GP-172'	13.25	40.00	47.00	24.00	46.50	34.15		0/5	-4.21
'GP-181'	13.60	41.50	50.00	19.20	44.00	33.66		0/5	-5.58
'GP-183'	12.17	42.50	44.00	22.20	47.75	33.72		0/5	-5.41
'GP-194'	6.66	43.00	46.00	22.80	50.00	33.69		0/5	-5.50
'GP-285'	17.88*	46.50*	48.00	28.20	46.75	37.47		2/5	5.11
Mean	14.37	43.28	47.25	25.78	47.56	35.65			0.00
CD (0.05)	2.11	2.37	4.52	5.80	11.01				
CV (%) Error	8.36	10.81	5.45	12.81	15.73				

* Significant at 5%

Table 3. Protein (%) in defatted seed cake and oil (%) in seed of tumba genotype

Genotype	Protein (%) in defatted seed cake			Oil (%) in seed		
	2001	Rank	%age increase/decrease over trial mean	2001	Rank	%age increase/decrease over trial mean
'GP-3'	43.30		8.36	39.10		-4.82
'GP-59'	43.80	I	9.61	41.90	III	2.00
'GP-119'	42.90		7.36	42.30	II	2.97
'GP-172'	33.30		-16.67	44.20	I	7.59
'GP-181'	43.50	II	8.86	40.80		-0.68
'GP-183'	37.20		-6.91	41.90	III	2.00
'GP-194'	37.50		-6.16	39.80		-3.12
'GP-285'	38.20		-4.40	38.60		-6.04
Mean	39.96		0.00	41.08		0.00

ulcers, asthma, bronchitis, urinary discharges, jaundice, enlargement of the spleen, tuberculous glands of the neck, dyspepsia, constipation,

anaemias, throat diseases and elephantiasis. The major use of tumba is establishing, shifting, sand dunes in desert area due to good soil binder.

The seed quantity 19-21% oil which is used for manufacturing shops and candles etc. Its fruits are used as feed for cattle, goats and camels.

It is found in warmer climate and tropical areas like that of Africa, especially in the region of Nubian. It is also seen in southern part of Asia including India, Pakistan and southern islands. This tree is native of dry areas around Africa and Turkey. It is easily found in desert areas of Sahara and in the Mediterranean region.

The variety 'Mansha Murudhara' has been developed from indigenous selection from local material ('GP 59') of Rajasthan region. The eight genotypes 'GP 3', 'GP 59', 'GP 119',

Medicinal properties

Terminalia arjuna is a unique herbal remedy for various heart problems. Due to its cardio protective role, it is being used in Ayurveda since 2500 BC and has remarkable cardio protective, heart muscle strengthening properties.

Bark

The bark of this tree is used in Ayurveda for prevention and treatment of many heart problems like angina, coronary artery disease, congestive heart failure, high cholesterol and blood pressure. Extensive research has led to discovery of cardiac glycosides in the bark and naturally occurring Co-Enzyme Q 10, which is really important nutraceutical for proper functioning of heart muscle. It gives strength to ailing heart and controls the cholesterol levels. *Terminalia arjuna* is thus one of the most effective herbal heart care remedies. Bark is astringent febrifuge, cooling, cardiac stimulant. It is an excellent remedy for heart diseases. The decoction with milk is given every morning on an empty stomach. The decoction is also used for cleaning sores and ulcers.

Bark contains a crystalline compound arjunine, arjunic acid, arjunctin, fridelin, tannin, reducing sugars, calcium and magnesium. Bark is cardiac tonic while fruits are deobstruent.

Paratha (fried chapati) made of wheat flour by mixing with the decoction of bark instead of mixing it with water, is given to eat in any type of heart trouble. Juice of fresh leaves is useful for relief in earache.

Chemical constituents of bark:

Terminalia arjuna bark is rich in many natural ingredients useful for heart problems. Current scientific research has proved that arjun contains specific medically active constituents namely triterpine glycosides like arjunetosides I, II, III, IV, arjunine and arjunetin.

- It contains a lot of natural anti-oxidants. Recently arjunone has been isolated from fruits along with cerasidin, b-sitosterol, friedlin, methyl oleanolate, gallic, ellagic and arjunic acids. These are all useful components to take care of the heart naturally.
- The bark is rich in saponnins, natural anti-oxidants (flavonoids-arjunone, arjunolone, leteilin) gallic acid, ellagic acid, oligomeric proanthocyanidins, phytosterols, rich in minerals like calcium, magnesium, zinc and copper.
- Regular use of arjun improves pumping activity of heart, improves cardiac muscle strength, decrease in LDL cholesterol levels.
- Bark of arjun tree has been found to be rich in co-enzyme Q-10 which is highly prescribed in cardiology for prevention of heart problems. The levels of Co-Q 10 decrease significantly after the age of 35 years and it can provide natural Co-Q 10 in high amount. High amounts of Co-enzyme Q-10 prevents incident of heart attacks. It has been reported to possess protective cardiovascular and hypolipidemic properties.

Heart disorder

The bark and preparations made

from it are known to have a marked stimulant action on the heart and have medicinal use in cardiac failure and dropsy. As a heart stimulant, either a decoction of the thick portion of the bark made with milk should be taken every morning on an empty stomach or its powder, in 0.75 to 2 g; should be taken with milk and jaggery.

Healing power and curative property

The bark of the arjun tree is a cardiac stimulant and has cooling and tonic effects. It helps to relieve fever. It is also useful in removing stones formed in the urinary system; in promoting flow of bile; and in the healing of wounds. It should be raised in block plantation as well as strip plantation serving dual purpose of bringing greenery on one side and generating income for rural people through tasar culture and arjun plant products on the other side which in turn provides benefit to the silk industry.

SUMMARY

Terminalia arjuna is a unique herbal remedy for various heart problems. Due to its cardio protective role, it is being used in Ayurveda since 2500 BC and has remarkable cardio protective, heart muscle strengthening properties. Numerous Ayurvedic medicines prepared from arjun tree are available in market also. The medicinal property described here give fundamental idea. Therefore, it is advisable to take various medicines only after proper medical advice from a recognized Ayurvedic physician. ●