

Estimation of tannin content in leaves, bark and fruits of *Terminalia arjuna* Roxb

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ABSTRACT

Terminalia arjuna is an important medicinal tree and demand for its bark has increased in international and national markets. Considering importance of this tree species as medicine and in tannin-based industries the present study was conducted to find out tannin content in its leaves, bark and fruits in experimental farm at Akola and Amravati, Maharashtra. Significant variations were observed in 20 even-aged trees of *T arjuna* for morphological characters viz bark, leaves and fruits. The highest tannin content of bark was observed in Wan-16 (13.76%) followed by Wan-17 (12.71%) and MB-3 (11.87%). The results revealed that the different parts like bark, leaves and fruits of the tree consisted of different concentrations of tannin.

Keywords: Arjuna; variation; tannin content; leaves; bark; fruits

INTRODUCTION

Terminalia arjuna Roxb, commonly known as Arjuna is a large deciduous tree. *Terminalia* is a genus comprising around 100 species belonging to family Combretaceae distributed in tropical region of the world. Trees of this genus are known especially as a source of secondary metabolites viz cyclic triterpenes and their derivatives, flavonoids, tannins and their aromatics. Flowers are sessile and occur in simple or panicle spikes (Dwivedi 2007).

T arjuna is well known medicinal plant. Its bark is extensively used as cardiac tonic and the demand for bark both in India and abroad has been growing rapidly for over a decade (Pandey and Mandal 2012). Tannin and flavonoids are responsible for its anticancer properties (Jain et al 2009).

Tannins are used in leather industry, for hardening the fibers of paper, in various medicinal applications, in the preservative treatment of fishing

nets, ink manufacture, in boiler water treatment for the prevention and removal of boiler scale etc. The present study gives an idea about tannin content in different parts of Arjuna like bark, leaves and fruits.

MATERIAL and METHODS

The present investigations were carried out at different locations in Akola viz Malkapur block (MB), Nagarjun Medicinal Plants Garden (NAG), Akola University campus and Amravati in Wan Wildlife Sanctuary, Akot (WAN), Maharashtra. Twenty trees of *T arjuna* having approximately uniform growth and age were selected and their bark was removed from the stem (trunk) without destroying the tree.

The fruits and leaves (5 fruits and leaves each) were selected from upper, middle and lower branches of the tree. Tannin content was determined as per Folin-Denis method (Thimmaiah 2009). The data obtained were statistically analyzed by using randomized block design in twenty treatments and three

Table 1. Tannin content in bark, leaves and fruits of *Terminalia arjuna*

number	Tannin (%)		
	Bark	Leaves	Fruits
MB-1	10.74	4.69	6.28
MB-2	8.17	5.07	6.96
MB-3	11.87	4.55	9.46
MB-4	10.06	5.57	7.55
MB-5	8.32	5.37	6.96
Nag-6	8.09	5.19	5.22
Nag-7	8.02	6.26	7.95
Nag-8	11.72	4.84	6.58
Nag-9	9.76	5.48	6.43
Nag-10	11.42	4.62	6.96
Wan-11	7.26	5.68	5.52
Wan-12	7.49	4.77	6.35
Wan-13	7.41	4.77	6.64
Wan-14	7.19	6.96	6.81
Wan-15	6.88	5.37	6.28
Wan-16	13.76	4.69	5.83
Wan-17	12.71	5.75	6.05
Wan-18	11.19	4.57	5.83
Wan-19	8.47	4.47	6.51
Wan-20	8.25	4.92	7.04
Mean	9.44	5.18	6.66

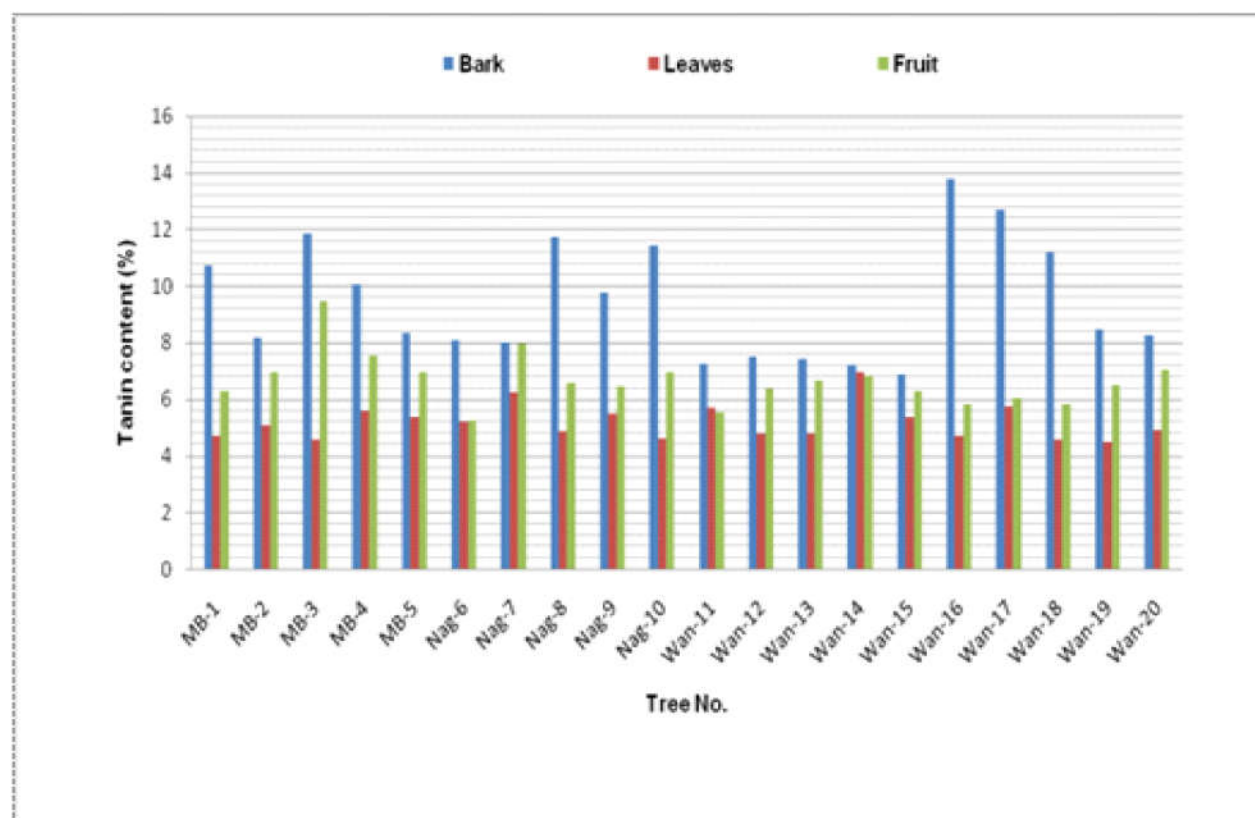
replications as per Panse and Sukhatme (1987) and Chandel (1984).

RESULTS and DISCUSSION

Significant differences were observed in the tannin content in bark, leaves and fruits of *T arjuna* (Table 1, Fig 1). In bark the maximum tannin content (13.76%) was found in Wan-16 and minimum (7.19%) in Wan-14. In leaves the maximum tannin content (6.96%) was noticed in Wan-14 and minimum (4.47%) in Wan-19. In case of fruits the maximum tannin content (9.46%) was found in MB-3 and minimum (5.22%) in Nag-6. Pandey and Kori (2009) studied variation in tannin that ranged from 6.75 to 14.82 g per 100 g. Singh and Sharma (2010) also observed similar results in case of *T chebula* fruits. Similar type of results of tannin content in bark, leaves and fruits were also reported by Patil and Gaikwad (2011a, 2011b).

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Fig 1. Tannin content in bark, leaves and fruits of *Terminalia arjuna*

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