

Proximate and Trace Elements Content of the Forest Tree Leaves of Dangs Collected During Summer Season

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ABSTRACT

Tree leaves samples from Dangs forest were collected during summer 1976 to know their proximate and trace element contents. Tree leaves are fed to cattle by the cattle owners as nothing is available in this season. Some of the tree leaves are highly nutritious (24% crude protein). They are also rich in calcium and trace elements except manganese. Some of the tree leaves are poor in zinc and copper contents. The ranges for Fe, Cu, Mn and Zn contents were 20.20 and 79.28 mg %; 2.67 to 12.67; 0.15 to 7.20 and 6.00 to 45.0 ppm respectively.

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INTRODUCTION

Problem of malnutrition amongst cattle in tribal area of Dangs district (Gujarat) was reported to this department hence this work was taken up. The tract is mostly hilly and densely covered with forest. In summer, temperature is as high as 44°C while the temperature in winter is as low as 4°C. The average annual rainfall is 200-250 cm. During summer there is acute shortage of fodder for feeding the ruminants. The failure of monsoon adds to the farmer's troubles not only in providing fodder for livestock but also in growing food for themselves. The forest tree leaves will be only fodder available for sustaining of life of livestock during scarcity and famine. Tree leaves are mainly available for feeding to their cattle during summer. Therefore, the work regarding study

on chemical and mineral composition of tree leaves was taken up.

MATERIALS AND METHODS

In May 1976 (Summer) different villages were randomly selected for survey in consultation with local authorities. The samples were collected from the villages viz. Pimpri, Pandharmal, Kalibel, Bhalkhet, Nadagkhadi, Ahwa, Chirapada, Bhapkal, Shanggahan, Sinbandh, Galkund, Mokhanamal, Pandharpada, Nani zardar, and Kirli.

Different types of tree leaves samples were collected for the estimation of proximate and trace element contents. The proximate analysis was carried out following the methods described by A.O.A.C. (1970). Trace elements viz. zinc, manganese, copper and iron were determined using wet digestion technique (atomic absorption spectrophotometry).

RESULTS AND DISCUSSION**(1) Proximate Composition:**

The results of proximate compo-

sition of various tree leaves collected during survey in Dangs district are presented in Table 1.

TABLE 1

Proximate composition of tree leaves collected during summer season in Dangs District (on % D.M. basis).

Name of Sample	C.Protein	E.Ext.	C.Fibre	N.F.E.	P	Ca.
1	2	3	4	5	6	7
<i>Amsar</i> (3)	10.2	3.7	25.2	51.6	0.19	1.32
(<i>Lager Stroemia</i> Spp.)	± 0.30	± 0.29	± 0.60	± 1.25	± 0.01	± 0.16
<i>Asan</i> (5)	11.6	3.9	17.9	59.9	0.27	0.85
(<i>Briolelia repesa</i> Spreng)	± 1.09	± 0.28	± 2.21	± 0.95	± 0.03	± 0.08
<i>Alev</i> (1)	14.6	4.9	9.0	66.5	0.20	0.54
(<i>Morinda tomentosa</i> Heyne)						
<i>Bamboo</i> (dry) (3)	5.1	3.3	24.5	43.6	0.15	0.86
	± 1.82	± 0.46	± 2.00	± 0.58	± 0.01	± 0.17
<i>Bamboo</i> (green) (3)	13.1	3.2	30.2	43.3	0.19	0.32
	± 1.00	± 0.43	± 1.67	± 1.25	± 0.03	± 0.02
<i>Bava</i> (1)	17.0	6.4	24.0	45.3	0.31	1.35
(<i>Cassia fistula</i> Linn)						
<i>Biwla</i> (7)	15.5	3.2	21.6	51.9	0.18	0.97
	± 0.58	± 0.10	± 1.28	± 1.06	± 0.01	± 0.07
<i>Bhet</i> (3)	23.9	5.2	20.2	43.0	0.26	1.58
(<i>Albizzia procera</i> Benth)	± 0.67	± 0.20	± 2.48	± 2.41	± 0.02	± 0.46
<i>Dandush</i> (1)	20.2	5.7	15.7	51.5	0.24	1.28
(<i>Dalbergia lanecolaris</i>)						
<i>Dhaman</i> (1)	14.5	4.3	15.5	55.5	0.22	2.46
(<i>Grewia hirsuta</i> Vant)						
<i>Dhamna</i> (1)	6.0	3.0	6.4	80.8	0.15	0.55
(<i>Grewia tiliaefolia</i>)						
<i>Kakad</i> (4)	9.6	4.1	13.3	64.7	0.28	1.21
(<i>Garuga pinnata</i> Roxb)	± 2.25	± 0.26	± 0.72	± 2.98	± 0.04	± 0.14
<i>Kalam</i> (1)	9.6	3.3	15.7	64.6	0.23	0.90
(<i>Pritragyna parvifolia</i>)						
<i>Kolai</i> (5)	20.1	7.8	13.1	50.8	0.44	0.98
(<i>Hymenodittyon exelsum</i> ; wall)	± 1.44	± 0.92	± 0.30	± 1.40	+ 0.05	± 0.07
<i>Kosim</i> (5)	8.8	3.4	25.6	56.1	0.21	0.01
(<i>Schlecheza oleosa</i> Oken)	± 0.46	± 0.25	± 2.76	± 2.97	± 0.03	± 0.13
<i>Mahuda</i> (1)	9.6	4.1	23.3	57.6	0.18	0.93
(<i>Madhuca indica</i> Gmel)						
<i>Mokha</i> (1)	7.5	4.1	15.9	67.6	0.15	0.61
(<i>Scherebora swetenioles</i> Roxb)						
<i>Papda</i> (2)	14.4	5.1	14.3	53.2	0.20	2.91
(<i>Ficus religiosa</i> Linn)						
<i>Payar</i> (2)	9.1	3.8	24.7	51.9	0.18	1.73
(<i>Ficus aitspide</i>)						

(Contd.)

(Table 1 contd.)

1	2	3	4	5	6	7
<i>Pipal</i> (6)	13.5	5.2	22.2	47.3	0.29	1.87
(<i>Ficus tsiela</i> Roxb)	± 1.30	± 0.28	± 1.46	± 0.93	± 0.03	± 0.18
<i>Sadad</i> (1)	10.5	3.0	8.7	69.7	0.24	1.33
(<i>Terminelia crenulata</i>)						
<i>Sirash</i> (5)	19.2	4.7	17.4	51.7	0.22	1.49
(<i>Abizzia odoratissima</i>)	± 0.85	± 0.60	± 2.24	± 2.61	± 0.01	± 0.39
<i>Sisam</i> (6)	17.5	3.7	22.0	49.9	0.24	1.29
(<i>Daalbergia sisoo</i>)	± 0.8	± 0.21	± 0.65	± 0.48	± 0.02	± 0.11
<i>Tnachh</i> (5)	13.4	3.2	22.0	54.0	0.20	1.01
(<i>Ougenia oigencensis</i>)	± 0.79	± 0.16	± 1.12	± 0.87	± 0.01	± 0.08

() Figures in the parenthesis indicates number of samples analysed.

From the results it is revealed that crude protein content of tree leaves ranges from 5.07 to 23.93 per cent. The richest source of c. protein among tree leaves include *bhet*, *bivla*, *bava*, *dandush*, *sirash*, *kolai*, *sisam* etc. Some of the tree leaves contain about 8 per cent ether extract viz. *Kolai* against normal ether extract content 3 to 4 per cent. Crude fibre content ranges from 6.37 (*Dhamana*, young leaf) to as high as 30.24 per cent (bamboo). Tree leaves like *Dhamana* (young leaf) contain about 81 per cent nitrogen free extract. Some of the tree leaves are good

sources of calcium viz. *papda* contains 2.91 per cent. The tree leaves are mainly fed during summer season. The proximate values for tree leaves reported by Jayal (1961), Jayal and Kehar (1962), Sen and Ray (1971) Jayal *et al.* (1973) and Ranjhan (1973 & 1977) are also in line with the above work.

(2) Trace element contents of tree leaves samples of Dangs district:

Average trace element (i.e. zinc, manganese, copper and iron) contents of tree leaves samples collected during summer season are presented in Table 2.

TABLE 2

Trace elements content of tree leaves samples collected during summer season survey in Dangs district.

Name of sample		Zn PPM	Mn PPM	Cu PPM	Fe mg %
<i>Asan</i> (2)		45.00	4.28	12.67	29.19
<i>Bamboo</i> (2)		33.60	7.20	5.50	79.28
<i>Bivla</i> (5)		27.12	2.74	8.59	28.15
		± 2.83	± 0.25	± 2.06	± 5.61
<i>Dhaman</i> (1)		28.80	1.50	5.67	20.20
<i>Kakad</i> (2)		20.40	2.48	5.84	64.10
<i>Kolai</i> (1)		30.00	7.05	6.67	33.45
<i>Kosim</i> (1)		16.80	3.00	11.67	28.15
<i>Mahuda</i> (1)		6.00	0.15	—	20.85
<i>Pipal</i> (4)		24.66	1.46	6.67	24.51
		± 7.34	± 0.27	± 1.15	± 1.62
<i>Sirash</i> (3)		15.20	1.80	4.00	29.88
		± 4.61	± 0.38	± 1.50	± 3.04
<i>Sisam</i> (2)		35.40	3.75	8.17	29.15
<i>Tanachh</i> (3)		18.20	1.10	2.67	28.48
		± 7.14	± 0.49	± 1.39	± 1.69

() Figures in the parenthesis indicates number of samples analysed.

From the perusal of data in Table 2, it is seen that ranges of trace element contents were 20.20-79.28 mg% iron (Fe), 2.67-12.67 ppm copper (Cu), 0.15-7.20 ppm manganese (Mn) and 6.00-45.0 ppm Zinc (Zn) in tree leaves samples collected during summer period. Manganese contents are very low in tree leaves. Zinc and copper contents are also low in some of the tree leaves. Zinc deficiency was also reported by Sawhney (1973) in Gujara-
rat to the extent of 16.18 per cent.

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