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Yield and Composition of *Prosopis juliflora* (*Vilayati babul*) Pods During Different Seasons

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ABSTRACT

Production potential of *Prosopis juliflora* pods and their seasonal chemical composition were studied for two years. The average pods yield/tree/year was found to be 18.95 kg. The pod yields during winter, summer and monsoon seasons were 49.2, 45.3 and 5.5% respectively.

The results on C. protein content of pods revealed that there was no significant ($P > 0.05$) variation among different trees, but significant ($P < 0.05$) variation was observed during different seasons and years. The C. Protein content was 12.15, 13.90 and 14.97% during winter, summer and monsoon seasons, respectively. Other constituents (Ether extract, C. fibre, N.F.E., P and Ca) were significantly ($P < 0.05$) altered during different seasons and years. The variation in composition observed may be due to different stages in maturity of pods.

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INTRODUCTION

Among the forest products, *Prosopis juliflora* pods have great potential in arid and semi-arid area of the country. Its leaves are unpalatable to the most of the species of animals and hence it has survived and flourished throughout the country. It grows in wide range of soil and climatic conditions. Its wood is good as fuel. It flowers twice in a year and provides source of nector for honey bees and pods as food for animals. Ripe pods fall on the ground below. Pods are yellow in colour with good smell, sweet in taste with hard small seeds. Pods are still not utilized by compounded animal feed industry eventhough acute shortage of cattle feed is aggravating day by day. It was considered that this important source was worth studying systematically. There are numerous reports suggesting yield of pods but there is no report wherein the yield of pods was measured for more than a single tree. This study was therefore, undertaken to know the production potential and seasonal chemical composition of pods under our conditions.

MATERIALS AND METHODS

Eight *Prosopis juliflora* trees of similar age group (approx. 10 yrs.) were selected from the trees grown on the road side at Gujarat Agricultural University, Anand Campus, Anand. From all the eight trees daily in the morning fallen ripe pods were collected continuously for two years covering six seasons. Daily collected pods were air dried, stored for one season and weight was recorded for each season. Representative pooled samples of pods were taken for proximate analysis from individual trees, during each season. The samples of pods were

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analysed for proximate composition by the methods of AOAC (1975). Statistical analysis of all the data were carried out by the procedures of analysis of variance as per method described by Snedecor and Cochran (1968).

RESULTS AND DISCUSSION

Yield of pods

The average results on yield of pods are given in Table 1.

The results of yield of pods indicated that on an average 18.95 kg pods can be obtained/tree/year. The yield of pods obtained from different trees were in the range of 6.30 to 52.2 kg/tree/year. However, the differences were found to be nonsignificant. Similar results were also reported by Garcia (1916); Loocke (1947); Anon. (1969); Jurriaanse (1973); Felker and Waines (1977) and Felker *et al.* (1984). They have reported the yield of pods in the range of 7.2 to 90.0 kg/tree/year.

It was observed under present study that the main fruiting seasons were winter and summer. The pod yields were 49.2, 45.3 and 5.5% during winter, summer and monsoon seasons, respectively. The differences in yield of pods from different seasons and years were found to be statistically significant. It was also noticed that during monsoon, flowering occurs but the pods setting was poor.

Estimate of availability of *Prosopis juliflora* pods from Gujarat

On the basis of information collected from Forest Department of the State about the area under *Prosopis juliflora* trees in Gujarat State and the actual yield data obtained as described earlier the availability potential of the pods was calculated as under :

TABLE 1

Yield of pods (kg/tree) during different seasons and years.

(Av. of eight trees)

Year/Season	*First*	*Second*
Winter	6.20 ± 1.40	12.44 ± 3.62
Summer	8.08 ± 1.38	9.10 ± 1.27
Monsoon	0.56 ± 00.11	1.53 ± 0.14
Total	14.84 ± 2.28	23.07 ± 4.66
Av./Year	18.95	

ANOVA

Sources of variation	*d.f.*	*'F'*	*C.D.*
Year	1	5.15*	5.62
Season(S)	2	19.15**	6.88
Tree (T)	7	0.96 NS	
S x T	14	2.09 NS	

*P < 0.05, **P < 0.01, NS = Non significant

Area under *Prosopis juliflora* trees*	44,830 ha.
Total number of trees* @ 625/ha	2,80,18,750
Total yield of pods @ 18.95 kg/tree	53,09,55,312.5 kg
If 40% of the pods are collected then the estimated yield will be.....	21,23,82,125 kg.

i.e. more than 200 thousands tonnes.

(*The figure excludes plantation under revenue department and on the borders of farmer fields).

Thus there is enormous availability of the pods for feeding of animals.

Proximate composition of pods

The pods collected during different seasons from each individual tree were analysed for proximate composition. The average results are given in Table 2.

TABLE 2

Chemical composition (% on D. M. basis) of *Prosopis juliflora* pods during different seasons and years (Av. of eight trees).

Season / *Const.*	*Winter*	*Summer*	*Monsoon*	*Average S.E.*
		First year		
C. Protein	12.32 ± 0.10	12.84 ± 0.30	13.96 ± 0.26	13.04 ± 0.48
E. Extract	3.61 ± 0.09	2.22 ± 0.13	2.57 ± 0.09	2.80 ± 0.40
C. fibre	25.41 ± 0.50	24.79 ± 0.73	34.10 ± 0.37	28.10 ± 3.00
N.F.E.	54.21 ± 0.71	55.40 ± 0.99	43.30 ± 0.54	50.97 ± 3.50
Ash	4.45 ± 0.25	4.75 ± 0.18	6.07 ± 0.52	5.09 ± 0.50
Silica	0.16 ± 0.01	0.26 ± 0.04	1.30 ± 0.23	0.57 ± 0.30
P	0.21 ± 0.02	0.22 ± 0.004	0.41 ± 0.01	0.28 ± 0.06
Ca	0.40 ± 0.02	0.47 ± 0.03	0.47 ± 0.03	0.44 ± 0.02
		Second year		
C. Protein	12.15 ± 0.26	13.90 ± 0.67	14.97 ± 0.23	13.67 ± 0.82
E. Extract	3.17 ± 0.11	2.72 ± 0.08	1.99 ± 0.13	2.63 ± 0.34
C. fibre	25.59 ± 0.65	28.54 ± 0.74	40.08 ± 0.55	41.40 ± 4.42
N.F.E.	54.74 ± 0.86	49.76 ± 1.23	35.27 ± 0.19	46.59 ± 5.85
Ash	4.35 ± 0.14	5.08 ± 0.20	7.69 ± 0.52	5.71 ± 0.01
Silica	0.22 ± 0.02	0.20 ± 0.04	2.53 ± 0.59	0.98 ± 0.77
P	0.23 ± 0.00	0.21 ± 0.01	0.24 ± 0.01	0.22 ± 0.01
Ca	0.62 ± 0.01	0.50 ± 0.01	0.60 ± 0.01	0.57 ± 0.27

Source of variation	Year		Season		Trees	
d.f.	1		2		7	
Const.	'F'	CD	'F'	CD	'F'	CD
C. Protein	4.61*	3.19	19.16**	3.90	1.12 NS	—
E. Extract	7.11*	0.13	4.28*	0.16	3.92*	0.23
C. fibre	47.49**	0.98	18.97**	1.20	1.49 NS	—
N.F.E.	41.52**	1.39	14.03**	1.70	2.97 NS	—
Ash	8.15**	0.44	8.67**	0.54	0.86 NS	—
Silica	3.76 NS	—	7.66**	0.53	1.05 NS	—
P	86.50**	0.01	1.51 NS	—	0.67 NS	—
Ca	63.81**	0.03	0.24 NS	—	0.77 NS	—

*P < 0.05, **P < 0.01, NS = Non significant

The results on C. Protein content of pods revealed that there was no significant variation among the different trees. However, significant variation was observed in C.Protein content during different seasons and years. Other proximate constituents were also significantly altered during the different years and seasons. However, there were no significant differences observed for proximate constituents between different trees except ether extract. Significant variations were observed during different years because of different stages of maturity of the pods. The variations in proximate composition observed under present study are in agreement with the results reported by Becker (1982).

The ranges in proximate composition of pods observed under present study are in line with the results reported by several workers (Walton, 1923; Schneider, 1947; Loocke, 1947; Anon. 1981- 82 and Del Valle *et al.* 1983). Thus pods of *Prosopis juliflora* has a good potential and will serve as a cheap energy source of highly palatable cattle feed from waste lands, saline soils, desert borders, road side plantation.

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