NUTRITIONAL VALUE OF SOME EVER GREEN INDIAN THAR DESERT TREES

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Characteristic flora of Thar desert includes many tree species forming potential source of nutritionally and phytochemically important metabolites for animals living in this region. Aerial parts of four species *Ailanthus excelsa, Cassia siamea, Parkinsonia aculeata* and *Tecomella undulata* were analysed for their nutritive values. All parts of selected plant species were nutritionally rich but maximum amount was found in fruits than flowers and leaves (minimum). *C. siamea* was found to be highly nutritional among four and *P. aculeata* least. All the species are ever green, rich in nutrients and available as fodder.

Keywords : Nutritive contents; Plant species.

District Bikaner, Churu and Jaisalmer are climatically important areas of Indian Thar Desert and characterized by their sparcely placed xerophytic flora including herbs, thorny shrubs and deeply rooted trees. Although strong solar radiations, very low relative humidity and scanty rainfall is responsible for diverse phytogeographic pattern of desert flora, even then plants growing in these reasons are rich source of nutritonally and phytochemically important metabolites as food source for desert animals.

Increasing live stock population and limited fodder sources have attracted the attention of many worker who have studied the nutritional values of many desert plant species like *Ficus bengalensis* and *F. religiosa*[1], *Azadiracta indica*[2,3], *Acacia nilotica*[4], *Acacia nilotica* and *Salvadora*[5], *Albizia lebbeck*[6], *Prosopis juliflora*[7], *Panicum turgidum*[8], *Cassia tora*[9], *Tribulus alatus, T. terrestris* and *Agave wighti*[10], *Citrullus colocynthis, Fagonia cretica and Lycium barbarum*[11], Zygophyllaceous plants[12], *Calligonum polygonoides*[13] and *Prosopis cineraria and Zizyphus mauritiana*[14].

Taking in to consideration all the adverse factors of Thar desert four commonly available trees were analysed for their nutritive values. Selected trees are : *Ailanthus excelsa* Rxb. (Simaroubaceae), *Cassia siamea* Linn. (Caesalpiniaceae), *Parkinsonia aculeata* Linn. (Caesalpiniaceae), *Tecomella undulata* Sm. (Bignoniaceae).

Different plant parts like leaves, flowers and fruits of individual tree species were collected from local areas, dried and powdered separately. Five samples of each plant part collected from different places were analysed and average was considered for analysis of nutritive contents like Crude protein, Crude fibre, Carbohydrates, Organic matter, Hemicellulose, Calcium and Phosphorus. Standard A.O.A.C.[15] method was followed for analysis.

The observations (Table 1) reveal that in *A.*

excelsa maximum amount of EE, Ash and P was found in leaves, NFE, TC in flowers and rest all i.e. CP, CF, OM, Ca, ADF, NDF and HC in fruits. *C. siamea* showed maximum amount of EE, Ash, Ca in leaves, NFE, TC, OM in flowers and CP, CF, P, ADF, NDF and HC in pods. *P. aculeata* presented maximum amount of NFE, TC, OM in flowers, CF, P, ADF, NDF and HC in pods while CP, EE, Ash and Ca in leaves. *T. undulata* gave maximum amount of EE, NFE, PC and OM in flowers, CP, CF, P, ADF, NDF, HC in fruits while only EE and Ca in leaves as shown in Table 1.

To estimate the maximum amount of each nutrient among different parts of each tree species, it was observed that P, CP, CF, ADF, NDF, HC were comparatively maximum in fruits, NFE, TC, OM in flowers and Ash, EE in leaves. Ca showed great variation in three parts of each plant species.

On comparing all four tree species with each other it was concluded that leaves of *A. excelsa* showed maximum amount of EE and P. *C. siamea* pods were found to be most nutritional having maximum CP, CF, ADF, NDF, HC (Ash in leaves). *P. aculeatata* also presented enough amount of nutritional components but less than *C. siamea*. *T. undulata* flowers also contained maximum amount of NFE and TC. Hence *C. siamea* was found to be highly nutritional selected species and *P. aculeatata* with least amount of nutrients.

Chemical analysis of all these ever green trees indicate that these are rich in nutrients and can be considered as concentration ration of the live stock.

References

1. Mia W H, Sahi B, Majumdar B N and Kehar N D 1960, Studies on tree leaves as cattle fodder. The

Table 1. Nutritive values of four species expressed in % on dry matter basis (five samples for each plant part).

Name of the plant	Plant part	CP	EE	CF	TA	NFE	TC	OM	Ca	P	ADF	NDF	HC
Ailanthaus excelsa	Leaves	18.02	07.32	07.25	07.50	59.89	67.15	92.50	03.48	01.23	18.80	20.80	02.00
	Flowers	16.27	04.51	08.43	07.40	63.37	71.81	92.60	03.60	00.78	18.80	22.60	03.80
	Fruits	20.05	05.25	09.29	07.20	58.21	67.50	92.80	03.75	00.81	20.20	24.42	04.22
Cassia siamea	Leaves	18.17	06.05	09.75	11.54	54.49	64.24	88.46	03.10	00.40	19.25	23.79	04.54
	Flowers	16.73	05.16	06.47	04.59	67.05	73.52	95.41	02.40	00.26	15.27	18.90	03.63
	Pods	23.41	04.13	18.13	07.13	47.20	65.33	92.87	03.00	00.41	35.21	43.00	07.79
Parkinsonia aculeata	Leaves	20.50	04.54	10.34	10.12	54.50	64.84	89.88	02.90	00.28	20.27	25.12	04.85
	Flowers	17.13	03.12	08.13	04.79	66.83	74.96	95.21	02.12	00.24	14.37	19.29	04.92
	Pods	20.34	03.89	14.54	06.49	54.74	69.28	93.51	02.70	00.31	32.27	39.11	06.84
Tecomella undulata	Leaves	12.42	04.14	08.57	08.48	66.38	74.95	91.52	03.20	00.54	17.20	21.40	04.20
	Flowers	09.10	04.24	07.37	04.85	74.44	81.81	95.15	02.95	00.48	13.40	18.80	05.40
	Fruits	14.47	03.89	08.87	06.67	66.10	74.97	93.33	03.11	00.67	18.20	23.49	05.29

CP	=	Crude Protein	
EE	=	Ether Extract	
CF	=	Crude Fibre	
TA	=	Total Ash	

NFE	=	Nitrogen Free Extract
TC	=	Total Carbohydrate
OM	=	Organic Matter
Ca	=	Calcium

P	=	Phosphorus
ADF	=	Acid Detergent Fibre
NDF	=	Neutral Detergent Fibre
HC	=	Hemicellulose

nutritive value of Bargad leaves (*Ficus bengalensis*). *Indian. J. Dairy Sci.* **13** 1-8.

2. Mathur C S 1960, *Common feed and fodder of Rajasthan, their chemical composition and feeding value.* Government of Rajasthan Publication : 26.

3. Jayal 1963, Neem (*Azadirachta indica)* leaves as a feed for lives stock. A study on their palatability. Chemical composition and nutritive value. *Indian Vet. J.* **40** 80-89.

4. Ganguli 1964, Preliminary studies on few top feed species. *Ann. Arid Zone* **3** 31-37.

5. Prasad 1964, Studies on chemical composition, digestibility and nutritive value of Babul pods (*Acacia arabica). Indian Vet. J.* **41** 418-421.

6. Sharma 1966, Chemical composition of some fodder tree leaves in Kangra district. *T. Res. R.A.U.* (Ludhiana). **3** 433-442.

7. Rajhan 1970, *Animal nutrition and feeding practice in India.* Vikas Publishring House Pvt. Ltd. New Delhi, India.

8. Purohit G R and Mathur C S 1970, Nutritive value of Murat *(Panicum turgidum)* grass. *Ann. Arid Zone.* **9** 261-264.

9. Patel 1971, Evaluation of *Cassia tora* seeds in partial replacement of concentrated mixture from the ration of mich cows. *Indian. J. Anim. Sci.* **41** 418-421.

10. NagT N, Mathur C S and Goyal S C 1979, Phytochemical studies of *Tribulus alatus, T. terrestris* and *Agave wighthi* content of primary and secondary product. Comp. *Physiological Ecol.* **4** 157-160.

11. Harsh M L, Purohit G R, Mathur C and Nag T N 1980, Nutritive value of dried terrestrial plants growing in Rajasthan. *Chemical composition and Comp. Physiological Ecol.* **6** 30-32.

12. Grover S and Nag T N 1984, Nutritive value of dried Zygophyllaceous plants growing in Rajasthan, *Chemical composition and Comp. Physiological Ecol.* **9** 250-252.

13. Bishnoi S and Gautam D D 1991, The reproductive capacity and nutritive value of *Calligonum polygonoides Linn. Ann. Arid Zone* **30** 139-144.

14. Goswami A and Yadav L 1995, Seasonal evaluation of nutritive contents of two arid zone plants. *J. Indian Bot. Soc.* **75** 1-2

15. A.O.A.C.1975, Official method of Analysis of Internalional, Washington, D.C., (U.S.A.)16th Ed, Vol-I & II, *Cunnifit. P.A.* (Ed).