

## Evaluation of Some Tree Species for Leaf Fodder in Tamil Nadu

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**Abstract:** Ten predominantly available trees were selected and chemical composition analysed and the IVDMD and intake by the animals determined. The study revealed that *Gliricidia sepium*, *Erythrina indica* and *Albizia lebbeck* are rich in crude protein i.e., 20 percent. Crude fibre of all the species tried was below 25 per cent and the drymatter digestibility ranged from 48.70 to 61.25 per cent. Intake by goats ranged from 2.74 to 3.14 per cent of body weight, for the species other than *Delonix elata*, *Albizia amara* and *Ailanthus excelsa*. The results indicated that *Gliricidia sepium*, *Erythrina indica*, *Albizia lebbeck*, *Azadirachta indica* and *Zizipus mauritiana* can be fed to the ruminants as a protein source whereas others can be considered as a supplement fodder.

**Key words:** Tree leaves, chemical composition, crude protein, palatability, digestibility

### INTRODUCTION

The potential of tree leaf as green fodder is not fully appreciated because of the fact the nutritional value of most of the trees has not been demonstrated. The preference of leaf fodder among different species also differs with the regions. Some trees that are extensively lopped in one region are not either lopped at all or their leaf fodder is considered to be of poor quality. Hence with the objective of finding out the nutritional value of some tree species widely available in this state and to rate them based on IVDMD and intake, this investigation was carried out.

### MATERIALS AND METHODS

Samples of leaves from ten tree species were collected. Representative samples of individual species were drawn and the moisture content was estimated immediately. Rest of the samples were dried and ground and sieved to pass through 1mm sieve and were analysed for crude protein, crude fibre, ether extract, total ash as per the method of AOAC<sup>[1]</sup>. Acid insoluble ash was estimated as per the method of Talapatra *et al*<sup>[2]</sup>. In vitro dry matter digestibility (IVDMD) of the samples was determined by the method of Tilley and Terry<sup>[3]</sup>. Dry matter intake was determined as per the method suggested by Schneider and Flatt<sup>[4]</sup>.

### RESULTS AND DISCUSSIONS

**Crude protein:** Wide variation was observed in the crude protein content of the leaves. It ranged from as low as 11.1 % in *Morinda citrifolia* to as high as 21.5 % in

*Gliricidia sepium*. Crude protein content in four of the ten samples was about 10 % indicating the potentiality of these leaves as a good protein supplement, which may help in substituting costly concentrate protein supplying feed stuffs like Groundnut oil cake, gingelly oil cake etc. Generally protein rich tree leaves can serve as a source of protein supplement for low quality diets. This is in good agreement with Chadokar and Kantharaju<sup>[5]</sup> who have found out that *gliricidia*, a high protein tree improved feed intake, weight of ewes and lambs and so can be effectively used as a feed supplement. Similarly Larbi *et al*.<sup>[6]</sup> have found out that *Erythrina sp* would effectively serve as a source of protein supplement.

**Crude fibre:** Crude fibre content also varied widely among the samples. *Delonix elata* had the lowest content of 12.67% and *Albizia amara* had the highest. However out of the ten samples, seven samples contained crude fibre less than 20 % indicating these are potentially more digestible and better sources of feed to livestock.

**EE, NFE and total ash:** Ether extract content varied from 2.90 % in *Acacia leucophloea* to 5.29 % in *Zizipus*. NFE content varied from 44.91- 61.18 per cent, with the highest content of 61.19 per cent in *Morinda citrifolia* and the lowest of 44.91 per cent in *Albizia lebbeck*. In general all the tree leaves recorded more than 45 per cent NFE content indicating a high level of soluble carbohydrate. Hence, all the leaves could be considered as a good energy source.

**Mineral matter (AIA, Calcium and Phosphorus):** All the samples except *Albizia amara* contained calcium content of more than 1 per cent indicating the potentiality

**Table 1:** Chemical composition, mineral matter content, animal intake and invitro dry matter digestibility of tree leaves in per cent (Dry matter basis)

| Name of trees             | Dry matter | CP    | CF    | EE   | TA    | NFE   | Acid Insoluble ash | Calcium | Phosphorus | Intake (% body weight) | IVDMD |
|---------------------------|------------|-------|-------|------|-------|-------|--------------------|---------|------------|------------------------|-------|
| <i>Acacia leucophloea</i> | 31.21      | 15.13 | 18.46 | 2.90 | 7.40  | 56.11 | 0.65               | 1.43    | 0.24       | 2.74                   | 49.75 |
| <i>Ailanthus excelsa</i>  | 28.4       | 18.20 | 18.62 | 3.53 | 5.87  | 48.22 | 0.70               | 1.81    | 0.21       | 1.78                   | 50.7  |
| <i>Albizia amara</i>      | 36.7       | 16.60 | 22.78 | 3.32 | 5.87  | 51.43 | 0.75               | 0.80    | 0.15       | 1.79                   | 47.6  |
| <i>Albizia lebbeck</i>    | 31.2       | 19.81 | 22.49 | 3.68 | 9.11  | 44.91 | 0.37               | 1.10    | 0.25       | 3.01                   | 50.75 |
| <i>Azadirahcta indica</i> | 27.05      | 14.63 | 21.10 | 3.97 | 11.68 | 48.62 | 0.59               | 1.31    | 0.25       | 2.98                   | 50.28 |
| <i>Delonix elata</i>      | 31.46      | 13.20 | 12.67 | 4.08 | 9.74  | 60.31 | 0.70               | 1.70    | 0.31       | 1.82                   | 56.84 |
| <i>Erythrina indica</i>   | 27.65      | 19.45 | 16.58 | 4.21 | 10.20 | 49.56 | 0.53               | 1.75    | 0.22       | 3.02                   | 60.05 |
| <i>Gliricidia sepium</i>  | 27.45      | 21.95 | 16.71 | 3.78 | 9.37  | 48.19 | 0.48               | 1.95    | 0.27       | 3.14                   | 61.25 |
| <i>Morinda citrifolia</i> | 26.84      | 11.10 | 16.81 | 4.09 | 6.82  | 61.10 | 0.60               | 1.40    | 0.36       | 2.82                   | 49.5  |
| <i>Zizipus mauritiana</i> | 34.01      | 17.01 | 21.22 | 4.29 | 6.90  | 50.58 | 0.24               | 1.08    | 0.46       | 2.91                   | 48.7  |
| Mean                      | 30.20      | 16.71 | 18.74 | 3.79 | 8.30  | 51.90 | 0.57               | 1.43    | 0.27       | 2.60                   | 52.54 |
| CD (P= 0.05)              | 1.91       | 1.09  | 1.28  | 0.28 | 0.59  | 3.65  | 0.04               | 0.11    | 0.02       | 0.20                   | 3.62  |

of all tree leaves as good source of Ca to animals. But, the phosphorus content of the leaves was low i.e. less than 0.5 per cent indicating that these trees are poor source of P.

**Palatability (Animal Intake):** The most important criteria in evaluation of feedstuff are the palatability. Palatability of the leaves was studied based on dry matter consumption. The dry matter consumption of seven samples was around 3 per cent of the body weight indicating good palatability and thus can be considered as good roughage for animals. Feeding *Glyricidia* to ewes as 25 per cent of total feed led to increased voluntary feed intake<sup>[5]</sup>. Increased total voluntary intake of feed by supplementing a basal diet of *Pennisetum purpureum* with increasing levels of *Erythrina abyssinia* was reported by Labri *et al.*<sup>[6]</sup>. The intake of *Albizia amara*, *Ailanthus excelsa* and *Delonix elata* by bucks was less than 2 per cent of body weight.

**In vitro dry matter digestibility:** IVDMD of the samples ranged from 46.7 per cent to 61.2 per cent *Glyricidia* and *Erythrina* recorded highest dry matter digestibility values of 61.2 and 60.05 respectively. It is evident from the results that the IVDMD values for all the samples are quite high and comparable with those of common forage. Less DMD was observed with high crude fibre content of the samples.

Based on the results, it is found that *Gliricidia sepium*, *Erythrina indica*, *Albizia lebbeck*, *Zizipus mauritiana* and *Azadirahcta indica* are highly nutritious

and therefore can be fed to the animals as a protein source. *Morinda sp* and *Acacia leucophloea* are fairly nutritious and palatable and can be fed as feed supplements. *Ailanthus excelsa*, *Albizia amara* and *Delonix elata* can be fed in supplementation with other roughages to ensure proper intake.

## REFERENCES

1. A.O.A.C., 1980. Official methods of analysis of the Association of Analytical chemists, 13th Edn. Association of official analytical chemists, Benjamin Franklin Station, Washington.
2. Talapatra, S. K., S.C. Roy and K. C. Sen, 1940. Estimation of Phosphorus, Chlorine, Calcium, Magnesium, Sodium and Potassium in feed stuffs. Ind. J. Vet. Sci., 10: 243.
3. Tilley, J.M.A. and R.A. Terry, 1963. A two stage technique for the *in vitro* digestion of forages. J. Br. Grassland Soc., 18: 104-109.
4. Schneider, B.H. and W. P. Flatt, 1975. The evaluation of feeds through digestibility experiments. Bulletin published by the University of Georgia Press. Athens, U.S.A.
5. Chadokar, P.A. and H.R. Kantharaju, 1980. Effect of *Glyricidia maculata* on the growth and breeding of Bannur ewes. Tropical Grasslands, 14: 78-82.
6. Labri, A., D. Thomes, and J. Hanson, 1993. Forge potential of *Erythrina abyssinica*: Intake, digestibility and growth rates for sheep and goats. Agroforestry systems, 21: 263-270.