

Dendrolobium spp. – a source of tropical multipurpose legumes

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1. INTRODUCTION

- Drought-tolerant legume shrubs can enhance the sustainability of smallholder production systems in the tropics by providing, year-round, high-quality feed and fuel wood, and services such as soil fertility conservation.
- *Dendrolobium* Benth. in Miquel, is considered a promising genus. It comprises some 12 species, all perennial shrubs or small trees native to tropical Asia, hitherto neglected by non-botanical research.
- The CIAT germplasm collection, assembled in the 1980s by collecting in tropical China, Thailand, Malaysia, Indonesia and Papua Guinea, needs to be assessed in terms of species diversity and agronomic variability in order to further explore the genus's potential.



Dendrolobium triangulare var. no. 1



D. triangulare var. no. 2

2. METHODS

- Collection of 52 *Dendrolobium* accessions held at CIAT is currently characterized and evaluated on an acid Ultisol at the CIAT-Quilichao Experiment Station, Cauca, Colombia: *D. lanceolatum* (14 accessions), *D. rugosum* (4), and *D. triangulare* (34 accessions, representing three distinct forms, probably different botanical varieties).
- Single-row plots with 5 plants each, 3 replications; seasonal dry matter yield and nutritional quality assessment of 8-wk regrowth; phenological and seed production observations in an additional replication.
- Molecular marker studies (RAPDs) to support taxonomic classifications.



Dendrolobium triangulare var. no. 3



D. lanceolatum

3. RESULTS

- Data from the first year of the experiment indicate a considerable range in dry matter (DM) production across seasons and nutritive value in terms of crude protein (CP) content and *in vitro* dry matter digestibility (IVDMD) (Table).
- Comparing with *Desmodium velutinum*, another SE Asian legume shrub tested at the same site 3 years ago, overall DM yields and IVDMD are low while CP content is similar.



Dendrolobium spp. Collection at Quilichao

Table: Herbage (edible = <5 mm stem diameter) DM yield of 8-wk old regrowth in the wet and dry season (1 cut each), and foliage CP content and IVDMD in the wet season in a 52-accession collection of *Dendrolobium* spp.

| Species (no. of accessions) | | DM (g/plant) | | CP (%Nx6.25) | IVDMD (%) |
|-----------------------------------|-----------|--------------|-------------|--------------|------------|
| | | Wet | Dry | | |
| <i>D. lanceolatum</i> (14) | Range | 5-44 | 15-84 | 12-17 | 29-50 |
| | Mean (SD) | 27.2 (16.8) | 43.3 (28.0) | 15.5 (1.1) | 37.8 (4.4) |
| <i>D. triangulare</i> var. 1 (25) | Range | 47-121 | 14-94 | 16-23 | 35-56 |
| | Mean (SD) | 82.4 (31.8) | 52.0 (29.7) | 20.0 (1.5) | 45.2 (3.8) |
| <i>D. triangulare</i> var. 2 (5) | Range | 16-242 | 20-116 | 16-22 | 41-65 |
| | Mean (SD) | 91.1 (102.4) | 44.3 (42.1) | 19.9 (1.7) | 49.5 (6.8) |
| <i>D. triangulare</i> var. 3 (4) | Range | 134-189 | 74-106 | 18-24 | 38-56 |
| | Mean (SD) | 153.8 (43.1) | 86.3 (36.7) | 21.2 (2.0) | 46.4 (6.8) |
| <i>D. rugosum</i> (4) | Range | 24-30 | 18-29 | 16-19 | 38-56 |
| | Mean (SD) | 26.7 (6.2) | 25.3 (10.5) | 17.2 (1.0) | 45.6 (5.9) |
| <i>Desmodium velutinum</i> (137)* | Range | 14-325 | 20-346 | 16-26 | 59-76 |
| | Mean (SD) | 137 (82.6) | 142 (81.9) | 21 (2.1) | 67 (4.2) |

* Schultze-Kraft, R., Peters, M., Vivas, N., Parra, F., Franco, L.H. 2005. *Desmodium velutinum* – a high-quality legume shrub for acid soils in the tropics. Tropical Grasslands 39: 231.

4. CONCLUSIONS

- Based on the results, mainly *D. triangulare* shows promise. Particularly its variety no. 3 deserves further attention.
- Studies to clarify the possible presence of antinutritive factors such as tannins and their effects on forage intake, are suggested.
- Regional testing of selected *Dendrolobium* germplasm is indicated.