**Flemingia macrophylla**, a tropical shrub legume for dry season supplementation

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### The species
- **Flemingia macrophylla** (Wild.) Kuntze ex Merr., synonyms F. congesta, Moghania congesta
- Perennial, leafy legume shrub for the humid and subhumid tropics
- Native to Southeast Asia; naturalized in West Africa and tropical America
- Multipurpose legume, used as soil cover, erosion barrier hedge, mulch and firewood in low-input smallholder production systems
- Outstanding features: wide range of soil adaptation, including acid, low-fertility soils; good drought tolerance; excellent regrowth after cutting
- Forage potential of widely used accessions limited in terms of digestibility due to high tannin content combined with low palatability to cattle

### Objectives of the study
- Describe variability in *F. macrophylla* collection with particular consideration of especially important plant characteristics related to feed quality (digestibility, dry matter production, crude protein, fiber and tannin contents)
- Identify accessions with promising agronomic potential to control accession CIAT 17403

### Materials and methods
- **Evaluation site:** Quilichao experimental station of Centro Internacional de Agricultura Tropical (CIAT), Cauca Department, Colombia; space-planted, single-row plots, random complete-block design with three replicates; collection comprising 74 accessions
- **Soil characteristics:** Acid Ultisol (pH 5.3), 76% Al saturation, medium P (6 ppm Bray-II) and high organic matter content (7.4%)  
- **Agronomic and morphological evaluation:** Parameters measured during two subsequent years: vigor, height, diameter, regrowth after cutting, incidence of diseases, pests and nutrient deficiencies, dry matter (DM) production during wet and dry seasons  
- **Nutritive value analysis:** Crude protein (CP) content and in vitro dry matter digestibility (IVDMD) of the entire collection; fiber (ADF, NDF, N-ADF), acetone-extractable and bound condensed tannins (ECT, BCT), astrogeny (protein-binding capacity), proanthocyanidin composition (D:C:P) in subset of 25 accessions; additionally subset of 10 high-quality accessions (including control) after 4, 6 and 8 weeks of regrowth in order to investigate effect of age on the above parameters

### Results
- **Entire collection:**  
  - 5 morphotypes identified: erect, semi-erect 1+2, prostrate, tobacco (Fig.1)  
  - IVDMD 28-58%, CP 13-25%, mean DM production 2.08 t/ha in rainy and 1.18 t/ha in dry season; no season x genotype interaction except for DM production in semi-erect 2 morphotype
  - 3 accessions (semi-erect 1) superior to control with IVDMD up to 54% and DM production up to 5.2 t/ha identified (Tab.1)
- **Representative 25-accession subset:** NDF 29.5-39.8%, ADF 17.0-29.2%, NADF 6.6-16.9%, ECT 0.19-4.4%, BCT 1.3-3.3%, astrogeny 1.7-6.8%.
- Correlations (P<0.01): ADF/NDF: r=0.549, r=0.645; IVDMD/ECT: r=0.694, r=0.576; ECT/astrogeny: r=0.712, r=0.721; IVDMD/astrogeny: r=0.632, r=0.548; D:C:P ratio (s. Fig. 2)
- **Subset of 10 accessions:** Forage quality varied with time, patterns different in rainy and dry season for both averaged values of the 10 accessions and individual accessions; correlations between BDF/ADF, and IVDMD/ECT/astrogeny.

### Conclusions and Recommendations
Agronomic characteristics and forage quality of *F. macrophylla* varied greatly among 74 accessions as well as between seasons. Materials differed greatly in IVDMD, DM production, ECT, tannin extractability (ECT/total CT), astrogeny and D:C:P ratios whereas CP and BCT showed only minor variability. IVDMD was negatively correlated with ECT and astrogeny.  
Seasons had a pronounced effect on IVDMD, DM production, plant height and diameter (higher in the rainy than in the dry season). No genotype x season interactions were detected.  
*F. macrophylla* accessions CIAT 18473, 21080 and 21090 with IVDMD up to 54% were identified for further testing as promising for dry season supplementation. However, their low seed production under the experiment conditions requires further research.

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