A PRELIMINARY INVESTIGATION INTO FORAGE QUALITY ATTRIBUTES OF SEVERAL NATIVE EASTERN SAVANNA SPECIES

Appalachian Plant Materials Center

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Senna hebecarpa, American senna

Lespedeza virginica, Slender lespedeza

Chasmanthium latifolium, Indian wood oats

INTRODUCTION

Nutritive attributes of traditional forages have been extensively researched and are well documented. Yet, nutritive attributes of most native species, especially Eastern savanna ecotypes, are virtually unknown. With recent heightened interest in silvopastoral systems, bioactive forages and specialty livestock, any information about nutritive attributes and bioactivity of native species becomes a valuable planning tool.

MATERIALS AND METHODS

Random grab samples of six native species were obtained from the Appalachian Plant Materials Center in late summer of 2007. Species sampled were: *Chasmanthium latifolium* (Michx.) Yates, Indian woodoats; *Lespedeza virginica* (L.) Britton, slender lespedeza; *Lespedeza capitata* Michx., roundhead lespedeza; *Rudbeckia hirta* L., black-eyed Susan; *Desmanthus illinoensis* (Michx.) MacMill. ex B.L. Rob. & Fernald, Illinois bundleflower; and *Senna hebecarpa,* American senna. Samples were air dried and ground to pass through a 0.5 mm screen to facilitate in vitro analyses. Ground plant materials were analyzed for: dry matter (DM) and ash (AOAC, 1999); total N (Thermo Flash EA 1112 Nitrogen Analyzer, CE Elantech, Inc., Lakewood, NJ); neutral detergent fiber (NDF) and acid detergent fiber (ADF) (Goering and Van Soest, 1970; Van Soest et al., 1991); and in vitro organic matter disappearance (IVOMD) (Tilley and Terry, 1963) using rumen fluid collected from two ruminally cannulated beef steers grazing pasture composed primarily of orchardgrass (*Dactylis glomerata* L.) and white clover (*Trifolium repens* L.). Animals had access to a commercial salt mixture containing macro- and micro-minerals. Crude protein (CP) was calculated using the following relationship: total N% multiplied by 6.25. Procedures for estimating extractable condensed tannin concentrations (ECT) in dried herbage were performed as described by Terrill et al. Unitan quebracho tannin, as obtained from Tannin Corporation, Peabody, MA, was used as the standard to estimate condensed tannin concentrations in the plant species tested.

RESULTS

SPECIES	CP (% DM base)	IVOMD (% DM base)	NDF (% DM base)	ADF (% DM base)	ECT (mg quebracho tannin/g DM)	Protein-bound CT (mg quebracho tannin/g DM)	Fiber-bound CT (mg quebracho tannin/g DM)
Chasmanthium latifolium	7.9	43.7	57.1	36.6	N/A	N/A	N/A
Desmanthus illinoensis	16.2	31	29.9	15.8	429	63	49
Lespedeza capitata	19.2	9.1	32	23	1597	150	46
Lespedeza virginica	17.3	11.2	44.4	29.2	1944	234	51
Senna hebecarpa	28.2	75.5	16	11.3	63	54	3
Rudbeckia hirta	15.1	64.2	24.4	19.7	38	86	35

DISCUSSION

The CP and IVOMD values for these six species indicate that all are potentially valuable livestock forages. However, the CP and IVOMD values presented here are likely influenced (elevated) by grinding the sample to pass through a 0.5 mm screen instead of a 1 to 2 mm screen which is standard for in vitro forage analyses. While the CP and IVOMD values indicate that all species are capable of providing an adequate to high level of nutrition, livestock acceptance or palatability remains an unknown.

Herbage with high ECT levels is a potentially valuable natural antihelminthic agent. The ECT concentrations for *Lespedeza capitata and virginica* indicate that these species are potentially highly valuable bioactive forages. Although *Rudbeckia hirta*, *Desmanthus illinoensis*, and *Senna hebecarpa* were found to contain slight to moderate levels of ECT, the concentrations were too low to justify further exploration of their usefulness as antihelminthic agents.

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Desmanthus illinoensis, Illinois bundleflower

Rudbeckia hirta, black-eyed Susan

Lespedeza capitata, roundhead lespedeza