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The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Fodder availability and nutritive value of two Sahelian browse plants : *Acacia senegal* and *Pterocarpus lucens*

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Key words : Browse fodder ,phenology ,chemical composition ,digestibility

Introduction The availability of feed resources is a crucial problem for livestock in the Sahelian area . Browse plants , by the diversity of species and their phenological variation , make them more regularly available compared to herbaceous plants . *Acacia senegal* and *Pterocarpus lucens* , which were well represented in the Sahelian zone of Burkina Faso , were also well utilised by farmers and ruminants , and the edible biomass production is important (Sanon et al . 2007) . These species were studied by the estimation of their phenological variation over time , the chemical composition , and the *in vivo* digestibility .

Material and methods Each species was selected on the pasture type where it is abundant : *A . senegal* in sparse woody steppe and *P . lucens* in tiger bush pasture . Four individual plants were chosen in the following height classes , <1 m , 1-3 m , 3-5 m , 5-7 m and >7 m and studied from June 2003 to March 2004 . The phenology of all the individuals selected was determined by scoring development of leaf , flower and fruit every second week . The foliage (leaves and green fruits/pods) was collected in the rainy season , at the optimum stage of vegetation in September 2004 , for chemical analysis . The samples were analysed for dry matter (DM) , crude protein (CP) , neutral detergent fiber (NDF) , acid detergent fiber (ADF) , acid detergent lignin (ADL) , and ash , according to standard methods . Leaves and pods collected by farmers , were dried , and used to feed the animals in a digestibility trial . Four groups of 5 mature goats of Sahelian type were allocated randomly to 4 diets consisting of leaves and pods of the two species . The pods were fed alone , while small amount (20%) of hay of *Schoenefeldia gracilis* , an annual grass , was added to the leaves and the digestibility was then determined by difference .

Results Both plant species started developing foliage immediately after the first rain in June . The time between the onset of flushing and full foliage was approximately 1 to 1.5 months . *A . senegal* was the first to loose its leaves by the end of the rains in October , and at the end of December , no *A . senegal* trees bore leaves . *P . lucens* kept its leaves longer , and at the end of March both species lost their fodder components . On average , the foliage phase lasted 6 to 7 months for *A . senegal* and 7 to 8 months for *P . lucens* . The flowering started almost at the same time as the foliage and the fruiting lasted on average 6 to 7 months . The individuals <1m did not bear flowers or fruits , nor did the class 2 of *P . lucens* (Figure 1) . The CP content was 157 and 217 g/kg DM and the NDF content 534 and 412 g/kg DM for *P . lucens* and *A . senegal* , respectively (Table 1) . The apparent digestibility of DM and CP of the leaves was 0.59 and 0.55 and 0.63 and 0.64 for *A . senegal* and *P . lucens* , respectively , higher than for the hay , which showed higher digestibility of NDF . *A . senegal* pods had higher digestibility for all nutrients than *P . lucens* pods .

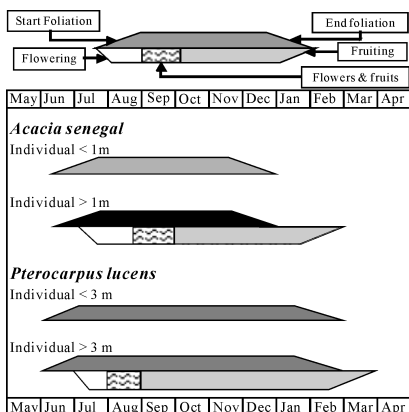


Table 1 Chemical composition and nutrient digestibility of forages from *A . senegal* and *P . lucens* .

Chemical composition					
	DM	CP	NDF	ADF	ADL
<i>A . senegal</i>	438(35.5)	217 ^a (23.4)	412 ^b (61.8)	216 ^b (36.1)	88 ^b (21.9)
<i>P . lucens</i>	427(45.0)	157 ^b (13.4)	534 ^a (21.5)	363 ^a (27.7)	177 ^a (20.0)
SE	9.9	4.2	11.0	6.5	5.6
Intake and nutrient digestibility					
	Intake g	DMD	CPD	NDFD	ADFD
Leaf					
<i>A . senegal</i>	477 ^b	0.60	0.69	0.42	0.62 ^a
<i>P . lucens</i>	537 ^a	0.55	0.70	0.42	0.55 ^b
SE	6.15	0.014	0.030	0.052	0.014
Pods					
<i>A . senegal</i>	647 ^a	0.63 ^a	0.73 ^a	0.46 ^a	0.63 ^a
<i>P . lucens</i>	507 ^b	0.54 ^b	0.64 ^b	0.31 ^b	0.53 ^b
SE	21.9	0.080	0.014	0.013	0.080

^{a,b} Means in the same column and same sub-title with different superscripts are significantly different P<0.05

Figure 1 Phenogram of *A . senegal* and *P . lucens* .

Conclusions The availability of browse biomass and its distribution in time in terms of edible biomass for the two species was good from June to February . Based on the high CP content and the digestibility characteristics , *P . lucens* leaves and *A . senegal* leaves and pods can be recommended as protein supplements to low quality diets .

Reference

Sanon , HO . Kaboré-Zoungrana , C . I . and Ledin , I . , 2007 . Edible biomass production from some important browse species in the Sahelian zone of West Africa . *J . Arid Environ* . (in press)