

*Short Communication***Summative and Ultimate Analysis of *Sesbania grandiflora***

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ABSTRACT

Sesbania grandiflora Pers (Family Fibaceae) Commonly known as Augustus is a fast growing perennial shrub. The wood meal of the plant was studied for its holocellulose, hemicellulose, α - cellulose and lignin content along with solubility in water, 1% NaOH and alcohol-benzene. Ash percentage, acetyl content, pentosans and element composition were also determined. The results have revealed that the wood has a low lignin content which is highly desirable for good pulp manufacture. Other values are comparable with those of other hardwoods used for pulping.

INTRODUCTION

*Sesbania grandiflora Pers (Family-Febaceae), Commonly known as Augustus is a fast growing 4-5m tall leguminous tree mostly grown in Bengal and southern states of India. The plant is grown as a support for pepper and betel vines, as shade plant for coconut seedlings and as a windbreak in banana plantations. The plant gives appreciable volume of wood within a short life cycle of 3-4 yrs. The inner bark of the plant yields a fibre used for cords and the wood is used for making toys and yields gun powder charcoal. Chemical composition of a plant material serves as a guide in determining its suitability for paper pulp making. The present short communication reports the summative and ultimate analysis of *S. Grandiflora*.*

Sesbania grandiflora wood logs of 3 years age were obtained from the Madhya Pradesh Van Vikas Nigam, Neapanagar. The wood meal was prepared according to TAPPI method². Standard methods were employed for analysis and moisture content of the wood meal was also determined to express all the values on oven dry basis.

RESULT AND DISCUSSION

The result of chemical analysis and elemental analysis of *S. Gandiflora* wood meal are recorded in Table - I. On summing up the extractives, lignins, ash and holocellulose constituents, the total value comes out to be 99.65. On summing up the values of extractives, alpa cellulose, hemicellulose, acetyl content and lignin, the total comes out to be 99.35%. In both the summation based on different methods, there is no appreciable difference and the values are close to 100% to practice the summation. Most of values of comparable with those of other hard-woods used for pulping⁶ (Table-1).

The results indicate that *S. Grandiflora* is of average cellulose content and has low lignin and low

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Table-1
Physico-Chemical Analysis of Some Fibrous Raw Materials

Particulars (Percentage)	Sesbania grandiflora	L. Leucocephala of 4 yrs age	Dendrocalamus strictus	Eucalyptus tereticomis	Eucalyptus hybrid	Bosewellia serrata	White spruce	Method (T indicates TAPPI method)
Basic density of wood(g/cm ³)	0.35	0.54	0.54	0.57	0.58	0.50	0.42	
Ash	2.00	0.77	2.40	0.30	--	2.27	0.30	T15-M58
Hot water solubility	2.85	2.35	10.10	3.20	6.58	14.23	5.20	T1-M69
Alcohol Benzene solubility	1.80	1.78	3.32	1.10	2.20	3.91	2.40	T6-M59
1% NaOH solubility	12.50	14.12	20.20	14.00	19.45	24.40	--	T4-M54
Lignin	20.50	23.14	25.80	27.20	25.52	25.70	27.10	T13-M54
α - Cellulose	45.95							T203-OS74
Holocellulose	72.50	72.56	62.20	70.00	70.10	50.70	73.00	Wise ³ (1945)
Hemicellulose	26.25							Wise ⁴ (1946)
Pentosans	18.80	17.00	18.10	22.90	16.00	19.29	12.30	T19-M50
Acetyl contents	1.90							Dore ⁵ (1920)
Carbon	48.20							Combustion
Hydrogen	6.40							Combustion
Nitrogen	0.75							Kjeldahl method
Oxygen	45.25							By difference

extractives percentage and therefore it may be considered suitable for pulping.

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