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Growth Characteristics and Ascorbic Acid Content of Several Genotypes of Jute (*Corchorus olitorius* Linn)

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Starchy staple foods of the tropical countries are usually eaten with leafy vegetables, such as jute. It is grown in Africa, the Caribbean, and tropical Asia for the preparation of draw-soup (Grubben, 1977; Purseglove, 1972). There is considerable diversity among accessions, with varying leaf shapes being important differentiating characteristics between cultivars (Akoroda, 1985). If a visible cultivar characteristic could be associated with edible leaf yield and ascorbic acid (AA) content, it could act as an indicator for identifying cultivars with the desirable qualities.

We describe characteristics of some Nigerian jute cultivars and attempted to associate some visible properties with yield potential and AA concentration and determine the appropriate time of harvest to optimize AA content.

Seedlots of eight accessions of jute were separately steeped in hot water (100C) for 10 sec to break dormancy. The seeds were air-dried and sown 2 cm deep in an open field. Each accession was planted in 1 × 1.5-m plots with four replications with spacing at 75 cm between rows and 10 cm within rows.

The soil is classified as Ferric Luvisol and Oxic Paleustalf. The surface soil (0 to 15 cm) is well-drained and is made up of 68% sand, 20% silt, and 12% clay, with a moisture retention of 17% at 30 kPa. The surface soil had 2.0% organic C, with a cation exchange capacity of 13.9 me/100 g.

Potassium, Mg, and Ca contents were 0.6, 3.8, and 9.3 me/100 g, respectively, and with a pH of 6.2 at a 1 soil : 2 water ratio. Eleven characteristics of each of the accessions were evaluated over two seasons at Ibadan (7°25´N, 3°25´E). In each season, 5 and 8 weeks after seeding, measurements or observations made included plant height; leaf shape; appearance; color; length and width; root length; dry weight (g/plant) of leaves, stems, and roots; and AA concentration of the edible portion (leaf). AA was determined on fresh leaf samples (with correction for moisture content) by the 2,6-dichloroindophenol method. The vitamin was extracted and titration performed in the presence of HPO_3–HOAC–H_2SO_4, according to the procedure of the Association of Official Analytical Chemists (1970).

After plant samples had been dried at 80C overnight, dry weights of the stem, roots, and leaves were determined. Root length was determined by measuring each root strand with a ruler.

Mean separation was by Duncan's multiple range test at $P \leq 0.05$ following analysis of variance.

Leaves were either serrated or deeply serrated (Table 1). They were simple and entire, with crenate margins in the serrated type but lobed with serrated margins in those deeply serrated. The leaf length : width ratio was consistent within a given cultivar and ranged between 1.58 to 1.72, with a mean of 1.62 in the deeply serrated leaves, while the range was between 1.65 and 2.50, with a mean of 2.05 in the serrated type. The average dry weight of edible leaves (economic harvest) was 11.0 and 7.9 g/plant for the serrated and deeply serrated types, respectively. Thus, the serrated type has significantly higher yield potential. The roots of the serrated type were more vigorous.

Average root length and dry weight in the serrated type were 17.2 cm and 2.3 g/plant, respectively, compared to 14.0 cm and 1.2 g/plant for the deeply serrated type. Thus, the serrated type may explore a greater soil volume and, therefore, yield more than the deeply serrated type. In addition, the serrated types were taller, with an average height of 40.4 cm compared with 34.5 cm for those deeply serrated and, therefore, can bear more leaves. AA concentrations of very glossy leaves were 25.5 and 117 mg/100 g at 5 and 8 weeks after seeding, while those of nonglossy leaves were 37.8 and 152 mg/100 g, respectively. Thus, at similar ages, nongloss leaves contained more AA than very glossy leaves. Leaf shape notwithstanding, nonglossy leaves accumulated 48% and 30% more AA than the very glossy leaves at 5 and 8 weeks of age, respectively.

AA content of the leaves was much higher at 8 weeks (mean 136 mg/100 g) than at 5 weeks (mean 36.8 mg/100 g). Thus, *Corchorus* rapidly forms AA between 5 and 8 weeks after seeding, with 8 weeks appearing to be a more desirable harvesting age. Serrated *Corchorus* cultivars with nonglossy leaves seem to possess desirably high yield potential and a high AA content.

Literature Cited

Akoroda, M.O. 1985. Morphotype in Nigerian landraces of *Corchorus olitorius*. J. Hort. Sci. 60:557–562.

Grubben, G.J. 1977. Tropical vegetables and their genetic resources. Rome IBPGRP p. 91–103.

Purseglove, J. 1971. Tropical crops. Longman, London.

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Table 1. Growth characteristics and ascorbic acid (AA) concentration of several jute genotypes.[z]

Accession no. (NH87-)	Plant ht (m)	Leaf[y] Shape	Gloss	Color	Length (m)	Width (m)	Root length (m)	Dry wt (g/plant) Leaf	Stem	Root	AA concn (mg/100 g) Weeks[x] 5	8
C02	336 c	1	3	2	68 c	43 c	127 c	6.9 c	9.4 cd	0.85 d	39	178
C04	322 c	1	3	2	106 a	45 bc	142 de	7.8 bc	7.3 d	1.13 d	42	126
C09	376	1	3	2	86 b	50 ab	151 cd	9.0 b	11.3 bc	1.67 bc	39	112
C07	524 a	2	2	2	116 a	54 a	174 b	11.6 a	23.0 a	2.00 b	39	124
C013	404 b	2	2	2	75 bc	43 c	144 de	11.2 a	12.6 bc	1.97 b	23	121
C014	343 c	2	3	2	85 b	34 d	201 a	10.0 a	6.8 d	1.27 cd	31	191
C016	380 bc	2	1	2	79 bc	42 c	169 bc	10.7 a	13.1 bc	3.07 a	28	130
C018	371 bc	2	1	2	66 c	40 c	173 b	10.9 a	13.3 b	2.97 a	23	104

[z]Mean separation within columns by Duncan's multiple range test at $P \leq 0.05$.
[y]Shape: 1 = deeply serrated; 2 = serrated. Gloss: 1 = very glossy; 2 = glossy; 3 = dull. Color: 1 = deep green; 2 = green; 3 = light green.
[x]Weeks after seeding.