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RESEARCH NOTE

Chemical analysis of sorrel leaf (*Rumex acetosa*)

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Sorrel (*Rumex acetosa*) is a shrub that is widely consumed in West Africa. Both the leaves and flowers are used as vegetables. They may be used fresh or dried. This work was designed to determine the chemical composition of sorrell leaf as part of its nutritional evaluation.

Sorrell, bought from markets in Jos, was cut, dried at 60°C and milled (AOAC, 1975). Crude lipid, crude protein (N × 6·25), total ash and moisture values were determined according to AOAC (1983) procedures. Crude fibre was estimated by the method of Joslyn (1970). The amino acid composition was determined by the method of Spackman & Moore (1958), and tryptophan and cysteine by the acid ninhydrin method of Gaitonde (1967). Sodium, potassium, magnesium, calcium, zinc and iron were determined using an atomic absorption spectrophotometer. Phytic acid was determined by the modified method of McCance & Widdowson (1935), soluble oxalate by the method of Abeza *et al.* (1968) and tannic acid by the AOAC (1975) procedure.

The proximate analysis of sorrell leaf is given in Table 1, the amino acid composition in Table 2 and the antinutritional factors in Table 3. The moisture content of 76·0 g/100 g suggests that the leaf loses moderate amounts of water and may keep for a few days without much deterioration. The ash content of 10 g/100 g is within the range for bitter-leaf, watercress and spinach (Oyenuga, 1968). The crude lipid (2·5 g/100 g) was lower than for cocoyam, but higher than those in bitter-leaf and spinach (Oyenuga, 1968). The crude protein (25 g/100 g) was higher than for most vegetables (Uddoh, 1980). The sodium, potassium and magnesium contents of the leaf (Table 1) were lower, while the calcium and iron contents were higher than the reported values for most common vegetables (Uddoh, 1980). Except for the high level of phytic acid (Table 3). which is known to reduce the bioavailability of zinc, calcium and iron (Erdman, 1979), the levels of oxalate and tannic acid were lower than the reported values for other vegetables (Oke, 1969).

All the essential amino acids are present in the leaf of *Rumex acetosa* and they compare very well with the

Table 1. Proximate composition of *Rumex acetosa* (moisture content 76·0 g/100 g fresh weight; mean of six determinations ± SD)

Component	Concentration
Total ash	10·0 ± 0·05 g/100 g (dry wt)
Crude lipid	2·5 ± 0·20 g/100 g (dry wt)
Crude protein	25·0 ± 2·00 g/100 g (dry wt)
Crude fibre	12·9 ± 0·65 g/100 g (dry wt)
Nitrogen free extract	50·0 ± 3·50 g/100 g (dry wt)
Sodium	5·0 mg 100/g (dry wt)
Potassium	440·0 mg 100/g (dry wt)
Calcium	1071·0 mg 100/g (dry wt)
Magnesium	104·2 mg 100/g (dry wt)
Iron	15·0 mg 100/g (dry wt)

Table 2. Amino acid composition of *Rumex acetosa* (g/16 g N)[a]

Amino acid	*Rumex acetosa*	FAO reference protein[b]
Isoleucine	3·73 ± 0·02	4·20
Leucine	9·60 ± 0·06	4·20
Lysine	8·73 ± 0·11	4·20
Methionine	1·82 ± 0·02	2·20
Threonine	5·60 ± 0·04	2·80
Phenylalanine	2·50 ± 0·01	2·80
Valine	7·80 ± 0·12	4·20
Tyrosine	4·93 ± 0·02	2·80
Tryptophan	1·0 ± 0·05	1·40
Cysteine	3·5 ± 0·25	2·0
Arginine	6·50 ± 0·21	
Histidine	4·50 ± 0·07	
Alanine	6·20 ± 0·11	
Serine	5·30 ± 0·08	
Proline	6·30 ± 0·08	
Glycine	6·80 ± 0·11	
Glutamic acid	13·80 ± 0·40	
Aspartic acid	8·90 ± 0·40	

[a] Values are means of five determinations (± SD), except for tryptophan and cysteine where values are means of three determination (± SD).
[b] FAO (1970).

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Table 3. Antinutritional factors in the leaf of *Rumex acetosa* (mg/100 g)[a]

Antinutritional factor	mg/100 g (dry wt)
Oxalic acid (total)	1·34 ± 0·03
Oxalic acid (soluble)	0·45 ± 0·04
Tannic acid	3·0 ± 0·20
Phytic phosphate	63·2 ± 4·5

[a] Values are mean of six determinations (± SD).

FAO (1970) reference protein (Table 2). The presence of all the essential amino acids, some far above the levels of the FAO reference proteins, and the low levels of some antinutritional factors, seem to suggest that the leaf of *R. acetosa* may be a cheap source of protein of a high nutritive value for both man and livestock in the tropics.

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