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Short Communication

Nutritional analyses of *Rumex hastatus* D. Don, *Rumex dentatus* Linn and *Rumex nepalensis* Spreng

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The study shows the presence of moisture, ash, crude fiber, proteins, fats and oils, and carbohydrates in proximate percentage in *Rumex hastatus*, *Rumex dentatus* and *Rumex nepalensis* (Family Polygonaceae).

Key words: *Rumex hastatus, Rumex dentatus, Rumex nepalensis*, nutritional analysis.

INTRODUCTION

The living organisms may be considered a biosynthetic laboratory, not only for chemical compounds (carbohydrates, proteins, fats) that are utilized as foods by man and animals, but also for multitude of compounds (glycolsides, alkaloids and volatile oils) that exert a physiologic effects (Claus et al., 1974). The nutrients essential for life are proteins, fat and carbohydrates, all contribute to caloric content of the dietary, minerals including trace elements, vitamins and water. Numerous studies, including in man, have demonstrated clearly that life may be sustained by nutrient mixtures in which every component is definable chemically and soluble in water (Underwood, 1994).

Most of the countries of the world have been facing malnutrition problems. The deficiency of protein in human food and animal feed is well recognized. The need of the good quality of proteins has been increasing due to rapid growth of population. It has been reported that in Pakistan the protein gap would continue to increase unless well-planned measures are adopted to tackle the situation. It is therefore imperative to increase protein production by utilizing all the available ways and means. In addition to increase conventional production, a great of work has been done in recent years in developing new chemical and biological methods for the production of protein foods and feeds (Shah and Khalil, 1988). *Rumex hastatus* juice is astringent and is used in bloody dysentery. The fresh tube is chewed to relieve throat aches. Root is laxative, alternative tonic and antirheumatic and is used in skin disease (Manandhar, 2002). The leaves and shoots of *R. hastatus* are diuretic, refrigerant and used as cooling agent (Islam et al., 2006). The leaves of *Rumex dentatus* are diuretic, refrigerant and used as cooling agent (Hussain et al., 2006). The root of *R. dentatus* is used as an astringent and in cutaneous disorders (Chopra et al., 1986). The root of *Rumex nepalensis* is purgative (Chopra et al., 1986; Manandhar, 2002). It is used as a substitute for *Rheum* spp (Chopra et al., 1986). A strong decoction is applied to dislocated bones. Root paste is applied externally to relieve headaches. Plant decoction is used to alleviate body pain (Manandhar, 2002). Duke and Ayensu (1985) reported fats, carbohydrates, water, protein, ash and fiber in *Rumex crispus*. Liu et al. (1998) reported oils from *Rheum wittrochii* Lundstr. Ming et al. (1998) reported 18 amino acids from roots, stems, leaves and fruits of *R. wittrochii* Lundstr.

The nutritional analysis was done for roots, stems, leaves, flowers, fruits and seed of *R. hastatus, R. dentatus* and *R. nepalensis*.

MATERIALS AND METHODS

R. hastatus, R. dentatus and *R. nepalensis* were collected respecttively from Peshawar University Campus. They were pressed in newspaper. Papers were changed from time to time to absorb water from plants. Plants were identified from the Flora of Pakistan (Ali and Qaiser, 2001). Protein, fats and oils, crude fiber, moisture content, ash value were determined by following A.O.A.C. (2000) method. Difference protein, fats and oils, crude fiber, moisture content, ash value from 100 determined carbohydrates.

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Table 1. Nutritional analysis of various parts of *R. hastatus* D. Don.

Plant part	Ash (%)	Moisture (%)	Protein (%)	Fats and oils (%)	Crude fiber (%)	Carbohydrate (%)
Root	5.25	20.22	13.65	2.54	19.37	39.04
Stem	6.23	26.80	6.05	4.50	19.26	36.19
Leaf	18.58	22.56	14.00	5.84	14.57	24.50
Flower	8.66	20.50	9.50	3.54	18.65	39.24
Fruit	9.73	24.01	13.59	4.57	15.06	33.04
Seed	15.50	23.05	12.01	4.56	16.06	28.88

Table 2. Nutritional analysis of various parts of *Rumex dentatus* Linn.

Plant part	Ash (%)	Moisture (%)	Protein (%)	Fats and oils (%)	Crude fiber (%)	Carbohydrate (%)
Root	8.37	9.33	10.58	14.66	10.65	46.40
Stem	7.59	6.23	15.72	11.44	8.76	50.25
Leaf	8.65	4.05	13.75	12.50	9.03	52.05
Flower	7.50	5.86	14.76	13.00	10.88	40.00
Fruit	6.99	6.23	10.50	11.80	11.67	52.84
Seed	8.44	4.91	12.12	11.12	9.00	54.40

Table 3. Nutritional analysis of various parts of *Rumex nepalensis* Spreng.

Plant part	Ash (%)	Moisture (%)	Protein (%)	Fats and oils (%)	Crude fiber (%)	Carbohydrate (%)
Root	6.40	4.79	11.12	15.57	13.50	48.62
Stem	9.73	5.30	15.30	18.69	10.78	40.20
Leaf	8.11	3.50	13.95	17.54	15.38	41.52
Flower	8.77	4.82	9.88	19.10	9.00	48.43
Fruit	4.95	3.00	14.84	11.78	14.60	50.83
Seed	5.47	3.40	18.53	13.80	17.40	41.40

RESULTS AND DISCUSSION

The nutritional values of *R. hastatus, R. dentatus* and *R. nepalensis* are presented in Tables 1 to 3. Ash content is highest in *R. hastatus* in leaf and lowest in root while it is highest in *R. dentatus* in leaf and lowest in fruit, and in *R. nepalensis* it is highest in stem and lowest in fruit. Moisture content is highest in *R. hastatus* in stem and lowest in root while it is highest in *R. dentatus* in root and lowest in leaf, and in *R. nepalensis* it is highest in stem and lowest in fruit. Protein is highest in *R. hastatus* in leaf and lowest in stem while it is highest in *R. dentatus* in stem and lowest in fruit, and in *R. nepalensis* it is highest in seed and lowest in root. Fats and oils are highest in *R. hastatus* in leaf and lowest in root while it is highest in *R. dentatus* in root and lowest in seed, and in *R. nepalensis* it is highest in flower and lowest in fruit. Crude fiber is highest in *R. hastatus* in root and lowest in leaf while it is highest in *R. dentatus* in fruit and lowest in seed, and in *R. nepalensis* it is highest in seed and lowest in flower. Carbohydrate is highest in *R. hastatus* in flower and lowest in leaf while it is highest in *R. dentatus* in seed and lowest in flower, and in *R. nepalensis* it is highest in fruit and lowest in seed. Alfawaz (2006) reported protein value of 17.1 – 20.1 g/100 g, moisture 87.8 – 93.5 g/100 g, ash 14.6 – 19.6 g/100 g and lipids 3.1 – 3.8 g/100 g in *Rumex vesicarius*. While studying several plants, Kononov et al. (2005) reported that the highest dry weight yield (8.8 t/ha) was obtained from *Medicago falcate* and the highest crude protein yield (1.58 t/ha) was from *Rumex acetosa*. The authors also indicated that crops such as *Melilotus*, *Amaranthus*, *Raphanus sativus* var. *oleifera*, *Glycine hispida* [Glycine max], *Rumex tianschanicus*, *M. falcata*, *Isatis tinctoria* and *Sida* can give a crude protein yield of 0.5-1.5 t/ha and can be cultivated in the region alongside the more common peas and lucerne.

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