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Elemental Constituent of Fresh Leaves of *Panicum* spp.

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Analysis of ash from the leaves of *Panicum miliaceum*, *P. sumatrense*, *P. maximum*, *P. repens* and *P. coloratum* was carried out in an atomic absorption spectrophotometer. Carbon and hydrogen levels were almost similar in all the species but other elements fluctuated in each species.

Key Words - Forage Metals Species Variation

Of the various properties that have to be considered to select a forage grass for cultivation, are its nutritive value, soil preference, allelopathic effect on the food or cash crop without affecting the main commercial crops. In animal nutrition, minerals play an important role by exerting direct influence on tissue growth and repair, body regulation or in the formation of body regulators and milk production. A total of about 20 elements are important in animal nutrition out of which 16 are considered as 'essential' and 4 as 'probably' essential (Banerjee, 1978). For proper mineral nutrition, not only the amount but also a balance of elements is essential. In the present investigation, element analysis of the ash obtained from fresh and mature leaves has been carried out in 5 species of *Panicum* to assess the nutritive value as forages.

MATERIALS & METHODS *Panicum miliaceum* L., *P. Sumatrense* Roth ex Roem et Schult., *P. maximum* Jacq., *P. repens* L. and *P. coloratum* L., form a part of the genetic stock of grasses maintained by the forage section of Birsa Agricultural University at Kanke, Ranchi. Plants were raised either from seeds or root-stocks and are maintained in the experimental garden of B.N. College, Patna in a randomised block design with three replicates. Only field materials were used making collections from row plantings. Fresh, mature leaves of approximately identical age were removed from randomly selected plants. The leaves were cut into small pieces and dried in an oven at 60°C for 24 h after which they were pulverized. Two g was weighed in a watch-glass and dried at 105°C in an oven for 3 h; the watch glass was placed in a desicator and allowed to return to room temperature. The ash was reweighed and placed in a beaker to which 20 mL of conc. HNO_3 was added. After an overnight pre-digestion of the material, 4 mL mixture containing 1 part conc. H_2SO_4 and 7 parts perchloric acid was added and the beaker containing the plant material and other chemical was kept on a sand-bath for further digestion and consequent reduction in volume. After copious fumes of H_2SO_4 had subsided, 10 mL of double distilled water was added to the beaker to obtain a clear solution. In case of any turbidity, the solution was reheated to boiling to make it clear. By adding double distilled water, the volume was raised to 25 mL to obtain the final stock solution for element analysis. All chemical analyses were carried out in a Carl Zeiss Atomic Absorption Spectrophotometer fitted with an automatic recording device.

RESULTS The most noteworthy feature was the almost identical level of carbon and hydrogen in the 5 species, but a marked variation in nitrogen which ranged from 3.23 per cent in *P. maximum* to almost negligible in *P. repens* (Table 1). Analysis of soils where the *Panicum* spp. was grown revealed it to be high in texture, having a pH of 6.6 and average organic carbon 0.55%, p. 26 kg/ha and K 320 kg/ha.

DISCUSSION In *P. maximum*, Ca, P, K, Na, Mg, Fe, I, Cl and S have been reported (Desha-

Table 1 Element analysis of *Panicum* species.

Element	*P. miliaceum*	*P. sumatrense*	*P. maximum*	*P. repens*	*P. coloratum*
Carbon(%)	40.2	39.5	39.3	41.7	41.5
Hydrogen(%)	5.8	5.6	5.7	6.4	7.0
Nitrogen(%)	1.6	2.2	3.2	trace	1.8
Mn	346	189	668	124	456
Fe	111	107	141	114	109
Co	0.3	0.2	0.1	0.1	0.0
Ni	21	15	36	8	24
Cu	1.5	3.0	3.2	1.5	1.5
Zn	6.4	6.1	13.7	1.5	6.1
Mg	723	602	862	482	361
Ca	1014	876	1509	658	1260
Sr	115	107	124	36	76
Ba	106	128	145	110	136
Cd	–	–	–	500	833
P	20	14	77	29	27
Na	2.0	1.2	35.0	10.2	12.2
K	91	24	85	40	84
Rb	18	26	16	9	22

(Quantity expressed as ppm except C, H and N)

prabhu, 1966) and in *P. repens*, the analysis of green forage showed the presence of Ca, P, Mg, Co and Cu (Deshaprabhu, 1966). Several unreported essential elements were detected. The data on *P. coloratum* confirmed the suitability of this species for use as green fodder. Its property of soil binding is an added advantage.

In pasture management major considerations in choice of species are : (i) adaptability of the species to the climate and soil, (ii) high yield of forage, (iii) palatability and nutrition, (iv) availability of forage at the time of the year intended (v) soil binding (vi) compatibility to companion species and similar response to management practices (Harlan, 1956; Banerjee, 1978; Ranjhan, 1980). For tropics and subtropics, among the *Panicums*, the most suitable is Guinea grass (*P. maximum*). As a fast growing fodder, *P. sumatrense* is a good choice and as soil binder and green fodder, *P. repens* and *P. coloratum* are most suitable. *P. miliaceum* also serves as a good green fodder.

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