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Evaluation of forages and soils in different waterlogged saline grasslands in western and southern coastal region of Sri Lanka

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Key words : waterlogging, salinity, forages, soils

Introduction It is estimated that salinity affected areas in Sri Lanka totals about 19,000 ha and its problem occurs in different areas. However information on natural forage species and their nutritive quality as animal feeds and the soil characteristics in these lands are lacking. The purpose of this study was to evaluate the nutritive quality of the most common forage species on their and soil characteristics pertaining to salinity in selected locations.

Materials & Methods The study was conducted in five waterlogged saline marshes that are traditionally used for livestock grazing viz; Kalutara (wet zone), Ambalangoda (wet zone), Matara (wet zone), Tangalle (intermediate zone) and Bundalla (dry zone) along western and southern coastal region from Jan. 2005 to Dec. 2005. Plant species were sampled along selected radial lines (three or four) in each location during 3 seasons. Dry matter (DM), crude protein (CP), crude fiber (CF), and ash contents were analyzed for most dominant and commonly fed species of the locations. Soils were sampled through the same radial lines in 3 replicates and analyzed for pH, electrical conductivity (EC), $\text{NO}_3\text{-N}$, $\text{Ca}^{++} + \text{Mg}^{++}$, SO_4^{-} and Cl^{-} .

Results & Discussion Out of 52 plant species recorded in the study, 7 species were dominant species and commonly used by animals. A wide variation and significant difference ($P < 0.05$) in the nutritive quality were observed among forage species (Table 1). Soil parameters such as pH, EC, $\text{Ca}^{++} + \text{Mg}^{++}$, SO_4^{-} and Cl^{-} levels were significantly different ($P < 0.05$) among locations while $\text{NO}_3\text{-N}$ level was nonsignificant (Table 2).

Table 1 Dry matter, Crude protein, Crude Fiber and Ash contents in commonly fed forage species*

Forage species	DM (%)	CP (%)	CF (%)	Ash (%)
<i>Cynodon dactylon</i>	32.98 ^a	11.16 ^b	43.72 ^b	14.33 ^{ab}
<i>Cyperus melanospermus</i>	34.09 ^a	9.60 ^c	31.26 ^c	9.65 ^c
<i>Eleocharis actangula</i>	27.30 ^{ab}	8.62 ^d	32.70 ^c	13.54 ^b
<i>Panicum repens</i>	21.47 ^b	7.36 ^c	46.46 ^b	15.26 ^a
<i>Panicum psilopodium</i>	29.19 ^{ab}	6.43 ^f	48.32 ^b	6.90 ^d
<i>Paspaladium germinatum</i>	26.28 ^{ab}	11.26 ^b	34.14 ^c	8.65 ^c
<i>Sacciolepis interapta</i>	18.08 ^c	15.14 ^a	69.28 ^a	13.87 ^b
SEM	0.90	0.06	0.02	0.06

Table 2 Soil pH, EC, $\text{NO}_3\text{-N}$, $\text{Ca}^{++} + \text{Mg}^{++}$, SO_4^{-} and Cl^{-} levels in experimental locations*

Location	pH	EC ($\mu\text{S}/\text{cm}$)	$\text{NO}_3\text{-N}$ (ppm)	$\text{Ca}^{++} + \text{Mg}^{++}$ (ppm)	SO_4^{-} (ppm)	Cl^{-} (ppm)
Kalutara	4.9 ^c	652 ^{cd}	7	396 ^d	29 ^d	125 ^d
Ambalangoda	4.0 ^c	4734 ^b	8	1675 ^c	610 ^b	525 ^c
Matara	3.4 ^d	982 ^d	6	400 ^d	987 ^a	200 ^d
Tangalle	6.5 ^b	2228 ^c	12	3500 ^b	175 ^c	675 ^b
Bundalla	7.7 ^a	7250 ^a	11	8250 ^a	1225 ^a	837 ^a
SEM	0.1	27	0.8	182	35	15

SEM = Standard error of Mean. Means within a column having same superscript is not different ($P < 0.05$)

* Mean values of 3 sampling seasons

Diversity of soil status pertaining to salinity seemed to be due to tide, topography and drainage behaviors of the locations.

Conclusion There is a potential for plant species that are naturally grown in waterlogged saline grasslands in coastal region of Sri Lanka to be utilized in livestock feeding.