VARIATION IN NUTRITIVE VALUE BETWEEN FOUR HALOPHYTIC SHRUB SPECIES COLLECTED FROM FIVE SALINE ENVIRONMENTS

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As the effects of dryland salinity become more prominent, the current challenge is finding use for saline land that will provide economic returns as well as managing rising water tables. One approach is to plant halophytes, such as saltbush (*Atriplex* spp.) and bluebush (*Maireana brevifolia*), as they are capable of producing edible biomass for animals despite high concentrations of salt in the root zones. However, the nutritive value of halophytes has been questioned due to their relatively high ash content. The aim of this investigation was to examine potential differences in nutritive value between 4 species of halophytes collected from 5 different saline environments.

Three species of saltbush (*A. amnicola*, *A. nummularia* and *A. undulata*) and bluebush were collected from five sites in Western Australia (Dalwallinu, Meckering, Tammin, Katanning and Lake Grace) that had previously been established to saline pastures, although not all species were present at all 5 sites. Five individual plants of each species were randomly selected from within a 2500 m^2 area for the collection of leaf material. The leaf material was analysed for the following attributes; *in vitro* and *in sacco* digestibility of the organic matter in the dry matter (DOMD), ash and insoluble ash content, acid detergent fibre (ADF), neutral detergent fibre (NDF) and nitrogen (N) content. *In vitro* digestibility was determined using a modified Klein and Baker (1993) pepsin-cellulase procedure. These *in vitro* measurements were not calibrated for *in vivo* digestibility due to a lack of reliable calibration standards from diets containing high salt. Since not all species were present at each site, an analysis of variance using unbalanced treatments was used.

Table 1 provides data on the nutritional attributes of the 4 halophytes. Bluebush tended to accumulate more ash and insoluble ash than the 3 saltbush species. *Atriplex nummularia* contained higher concentrations of N and was more digestible than the other species. However, *A. amnicola* and *A. undulata* had higher ADF and NDF concentrations. Considering the standard deviations, it was apparent that there was variability within the 4 species of halophytes, with *A. amnicola* and *A. undulata* showing greatest differences in both *in vitro* and *in sacco* digestibility, and ash content. However, the reasons for such differences could not be determined.

Table 1. Nutritional attributes (means (% of DM) ± s.d.) of 4 halophytes (see the text for details).

Species	*In vitro* DOMD	*In sacco* DOMD	Ash	Insoluble ash	Acid detergent fibre	Neutral detergent fibre	Nitrogen
A. nummularia	62.0 ± 3.2^{c}	41.9 ± 3.5^{b}	29.1 ± 3.3^{b}	5.3 ± 0.5	13.4 ± 1.3^{a}	25.2 ± 2.2^{a}	2.5 ± 0.4^{b}
A. amnicola	56.5 ± 5.5^{b}	40.4 ± 5.2^{b}	28.1 ± 3.0^{b}	5.6 ± 0.8	18.0 ± 1.3^{b}	32.2 ± 1.2^{b}	2.1 ± 0.5^{a}
A. undulata	56.4 ± 5.8^{b}	37.6 ± 4.8^{a}	26.4 ± 2.3^{a}	5.1 ± 0.5	18.5 ± 1.0^{b}	32.9 ± 0.5^{b}	2.4 ± 0.9^{b}
M. brevifolia	52.5 ± 3.2^{a}	37.1 ± 4.4^{a}	29.9 ± 2.1^{b}	5.7 ± 1.1	13.6 ± 1.6^{a}	31.3 ± 2.8^{b}	3.3 ± 0.8^{c}

Values in columns with different superscripts are not significantly different ($P<0.05$)

In conclusion, *A. nummularia* and bluebush could be candidates as summer/autumn forage due to their relatively high digestibility and crude protein content, respectively. The large variability in the digestibility of *A. amnicola* and *A. undulata* indicate further investigation into these two species may determine whether differences that were observed were attributable to genetic or environmental effects.

KLEIN, L. and BAKER, S.K. (1993). *In* 'Proceedings of the 18th International Grassland Congress (New Zealand).' pp. 593-595.

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