

POTENTIAL TO USE N-ALKANES IN PLANT CUTICULAR WAXES TO DISCRIMINATE PLANT PARTS OF SUBTERRANEAN CLOVERS EATEN BY RUMINANTS

S.K. BAKER^{ABC} and L. KLEIN^{AB}

^ACSIRO Division of Animal Production, Private Bag PO, Wembley, W.A. 6014

^BCLIMA, The University of Western Australia, Nedlands, W.A. 6009

^CFaculty of Agriculture, The University of Western Australia, Nedlands, W.A. 6009

Differences in concentrations of n-alkanes in the cuticular waxes of plants can be used to estimate the species composition of herbage mixtures when they contain plant species from different genera (Dove 1992). In this study n-alkanes from a single plant species were used to discriminate among the leaf, stem and petiole fractions of cultivars of subterranean clover.

Six cultivars of subterranean clover (*Trifolium subterraneum*) Geraldton, Daliak, Dalkeith, Dinninup, Trikkala (ssp *yannicum*) and Clare (ssp *brachycalycinum*) were grown in individual boxes (3 replicates per cultivar) in open-sided shade houses. They were defoliated to ca. 2 cm above the soil surface twice during their growth and were harvested when the plants were senesced and dry. Concentrations of n-alkanes in the leaf, petiole and stem fractions were determined by gas chromatography (see Dove 1992).

The concentrations of the n-alkanes C₂₇, C₂₉, C₃₁ and C₃₃ differed among genotypes and plant parts (P < 0.005). In general petiole contained more of each alkane, especially C₂₉, than the other plant parts. The ratios of the concentrations of the alkanes one to another together with logarithmic transformations of the concentrations of the alkanes were used in canonical variate analysis. The first 3 canonical factors accounted for about 70% of the variance and the error rate in classification of cases was 3%. Discrimination among the genotypes and in most cases among their plant parts is clear from comparison of bivariate plots of the first 3 factors (Figure 1). This suggests that selection by sheep of plant parts from mixed swards of cultivars of subterranean clover during summer and autumn could be determined from the faecal recovery of n-alkanes.

This work is supported in part by the Wool Research and Development Corporation.

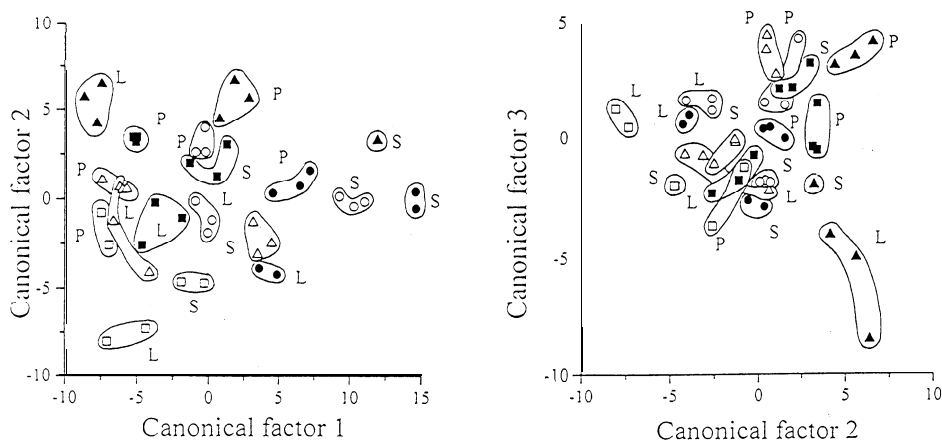


Figure 1. Bivariate plots of the first 2 canonical factors in canonical variate analysis, used to discriminate leaf (L), petiole (P) and stem (S) fractions of cultivars of subterranean clover: Geraldton (open squares), Clare (closed squares), Daliak (open circles), Dalkeith (closed circles), Dinninup (open triangles) and Trikkala (closed triangles)

DOVE, H. (1992). *Aust. J. Agric. Res.* **43**: 171-174.