99. Effect of the concentration of condensed tannins in different sainfoin accessions grown at three sites on *in situ* ruminal degradation kinetics of dry matter and crude protein (Einfluss der Konzentration an kondensierten Tanninen in verschiedenen Esparsettensorten von drei Standorten auf die ruminale Abbaukinetik von Trockenmasse und Rohprotein *in situ*). B.N. Azuhnwi*, B. Thomann, Y. Arrigo, B. Boller, H.D. Hess, M. Kreuzer and Frigga Dohme – Posieux/Zürich

Concentration of condensed tannins (CT) has been shown to vary amongst sainfoin accessions (1). The significance of this variation for the quality of sainfoin (*Onobrychis viciifolia*), one of the few tanniferous temperate legumes, is not yet known. Using the *in situ* technique, known to be a good predictor of ruminal degradability of feed and therefore forage quality, this study set out to investigate the variation in *in situ* degradation kinetics of dry matter (DM) and crude protein (CP) of five accessions of sainfoin cultivated at different sites in Switzerland.

Methods: Five sainfoin accessions, comprising of three landraces (Moiry, Premier, Sarzens) and two commercial cultivars (Perly, Visnovsky), were established in 2007 at Thun (TH, altitude 565 m above sea level), Ellighausen (EL, 520 m) and Reckenholz (RE, 440 m). The plant material was harvested at about 5 cm above ground level in May 2008 and frozen. The samples were lyophilised and ground to pass a 3-mm screen. The chemical composition was determined using standard protocols. The butanol/HCl method (2) was applied to determine the concentration of CT using a standard obtained from the cultivar Visnovsky. The *in situ* technique was used to determine ruminal degradation kinetics of DM and CP using three rumen-cannulated cows by incubating the forage samples in nylon bags for 2, 4, 8, 16, 24 and 48 h (n = 3). Degradation of DM and CP was corrected for small particle losses. The effective degradability was calculated with an assumed passage rate of 8 %/h. Data were evaluated by analysis of variance based on the two-factorial (site and accession) experimental design. Pearson correlations were calculated between CT content and CP degradability.

Results: Across cultivation sites, CP content was highest for the landraces Premier (171 g/kg DM) and Sarzens (163 g/kg DM) followed by Moiry (147 g/kg DM) and the commercial cultivars Perly (147 g/kg DM) and Visnovsky (145 g/kg DM). The CT content ranged from 48 to 70 g/kg DM and was highest for Sarzens and lowest for Perly. The CP content across accessions was similar at TH and EL (162 g/kg DM) and lower at RE (139 g/kg DM). The CT content was highest at EL (61 g/kg DM) followed by TH (57 g/kg DM) and RE (54 g/kg DM). The soluble (A), the insoluble but degradable (B) and the potentially degradable (D) fractions characterising the kinetics of DM degradation were also affected by accession. Fraction A was highest in Perly and lowest in Premier ($P < 0.001$) while fractions B and D were highest in Moiry and lowest in Sarzens ($P < 0.001$). CP degradation kinetics was influenced in a way that fractions A and D were highest in Moiry and lowest in Sarzens ($P < 0.01$). Cultivation site had an effect on both DM and CP degradation. All three fractions were higher at EL and TH compared to those at RE ($P < 0.001$). The DM and CP degradability was highest in Moiry (41.7%, 48.4%) and lowest in Premier (35.6%, 40.1%; $P < 0.001$). The cultivation site affected degradability of DM (EL: 41.7%, TH: 41.1%, RE: 35.4%; $P < 0.001$) and CP (TH: 46.2%, EL: 45.3%, RE: 42.1; $P < 0.001$). Accession × site interactions were observed for all traits ($P < 0.01$).

Conclusion: CT content and ruminal nutrient degradation kinetics in sainfoin were largely influenced by accession and cultivation site. The negative correlation (-0.57, $P < 0.01$) between CT and ruminal CP degradability indicates that this was an effect of CT and CT could be used as a prediction trait.

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