

## Chemical composition of different fractions of *Solanum lycocarpum* St Hil

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**Introduction** Globally methane released from the rumen represents approximately a third of all anthropogenic actions and novel crops could be an alternative to tackle this problem (Beauchemin *et al.*, 2008). In addition the development of arid resistant plants and natural products to manipulate ruminal fermentation are being speculated as part of cutting edge technologies currently under study to optimize ruminal function. In this context the wild shrub *Solanum lycocarpum* St Hil. could be an alternative crop as well as novel rumen manipulator agent. Here its chemical composition is presented as part of a project which has been investigating the use of some fractions of this plant as a potential animal feedstuff.

**Materials and methods** Five dried meal-like fractions of *Solanum lycocarpum* (SL) (Flower=Fl, Fruit=Fr, Leaf=Lf, Stem=St and Root=Rt) from two different seasons (wet/summer –between January/March and dry/winter – between July/September of 2008) from Brazil were analysed in triplicates for their Crude Protein (CP), Ether Extract (EE), Total Sugar(TS) and Starch (ST), Total Phenols(TP), Tannins (TN) and Saponins (SP). Samples were gathered in the afternoon, sliced in small parts and spread under shadow for about 48 hours to reduce their moisture contents. Then the fractions were milled, oven dried at 60°C overnight and air transported to the UK. Proximate analysis was determined according to AOAC (1980). Phytochemicals were assayed using standard methods with little modifications. Total phenols, condensed tannins and saponins were determined by the method of Herborne (1978). The data were analyzed by using General Linear Model of Minitab to study the main effects of SL fractions and season as well as their interactions on chemical composition.

**Results** Mean chemical components for different fractions of *Solanum lycocarpum* different seasons are shown in Table 1. The main effects of SL fractions were significant for CP, TS, ST, TP and SP ( $P<0.05$ ). Flower had the highest CP level with difference between seasons ( $P<0.01$ ). Total sugar was higher for the stem and starch for the root ( $P<0.05$ ). Total phenols were significantly higher in Flower and Fruits than other fractions. Saponins were higher in Fruits and Leaves but did not vary between seasons ( $P>0.05$ ). Additionally, no significant interactions between fractions and seasons were observed ( $P>0.01$ ) with the exception of CP and SP ( $P<0.05$ ).

**Table 1** Chemical composition of *Solanum lycocarpum* fractions from two different seasons (g/100g)\*\*

Fraction	Season	CP	EE	Total Sugar	Starch	Total Phenols		Condensed Tannins (CT)	Saponins
						(GAE)			
Flower	S	22.7	1.5	0.11	0.20	2.32		16.2	1.6
	W	15.2	1.5	0.10	0.18	2.30		16.1	1.7
Fruit	S	5.3	3.3	0.02	0.12	1.68		12.7	2.5
	W	4.2	3.0	0.01	0.11	1.68		10.0	2.3
Leaf	S	19.7	2.2	0.11	0.12	1.20		16.3	2.2
	W	18.0	2.0	0.11	0.11	1.21		14.9	1.1
Stem	S	4.5	2.5	0.13	0.14	0.54		12.4	1.2
	W	1.2	2.2	0.12	0.14	0.52		11.9	1.1
Root	S	5.2	3.0	0.08	0.22	0.34		13.2	0.8
	W	5.0	2.8	0.07	0.22	0.33		13.1	0.5
SEM (fractions)		3.2	1.2	0.12	0.15	0.29		1.3	0.9
Significance	*	**		*	*	**			*

\*\*  $P<0.01$ ; \*  $P<0.05$  (in each of the columns, shows statistical differences between fractions); SEM (Standard error of means); S= Summer & W=Winter; CP= Crude Protein; EE = Ether Extract; GAE= Gallic Acid Equivalent

**Conclusions** All fractions showed statistical differences regarding all chemical constituents with the exception of EE and CT. Secondary metabolites are present in high levels and demand further investigations to evaluate their effect on ruminal metabolism.

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