

NUTRITIVE QUALITY OF FLOWERS IN SOME EARLY-PLANTS

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Summary

In spring time, animals, goats and sheep in particular, prefer to eat flowers *Pulsatilla multifida*, and *Iris tenifolia*. *Pulsatilla's* flower contains sugar 20.33, starch 6.71, cellulose 19.15, lignin 6.50, and acid detergent fibre (ADF) 24.88, neutral detergent fibre (NDF) 32.55, hemicellulose 7.67, and protein 14.27 percent. Dry matter digestibility (DMD), organic matter digestibility (OMD) of *Pulsatilla multifida* were found 84.35, 84.17%, respectively.

Flowers of *Iris tenifolia* contain sugar 38.89, starch 3.71, protein 18.42, cellulose 9.04, lignin 12.98, ADF 15.60, NDF 19.60 and hemicellulose 4.0 percent. DMD, OMD of *Iris tenifolia* were found 89.69% and 89.79%, respectively.

Key Words: *Pulsatilla multifida*, *Iris tenifolia*, gas production, digestibility, plant preference, early plant, sheep and goat nutrition.

Introduction

The various parts of plant differ widely in nutritional value and palatability. When animals -particularly goats and sheep - are left to graze, they select the more nourishing parts of the plants.

In late April or early May before the new growth of plants *Pulsatilla multifida* and *Iris tenifolia* flower in Mongolia. *Pulsatilla multifida* is distributed in the high mountain and forest -steppe, *Iris tenifolia* is distributed in steppe and desert-steppe. In spring time animals, in particular, goats and sheep prefer to eat flowers both of those early plants.

This paper seeks to describe the degradation characteristics and chemical composition of flowers of the above mentioned early plants.

Materials and Methods

Samples were collected at the beginning of May. The samples were air dried before being milled through a 1 mm sieve, were analysed for dry matter (DM), organic matter (OM), crude protein (CP), ADF, NDF determined by AOAC (1984) methods.

In vitro gas production and digestibility were determined by Theodorou and et al. (1991) developed methods.

Statistical procedure

Cumulative gas production data were corrected to 1g DM by ml. *In-vitro* digestibility (%) was calculated assuming that all of the residual dry matter after 70 h fermentation was unfermented substrate. The degradation characteristics were described using the exponential equation $p=a+b(1-e^{-ct})$ adopted by McDonald (1981) and Orskov (1990) where p is gas production at time t and $(a+b)$ was the potential gas production and c the rate of gas production. However, in evaluation of plants there is often an initial lag phase which gives rise to negative a value.

All chemical components were reported as percentages which were presented on a dry-matter basis.

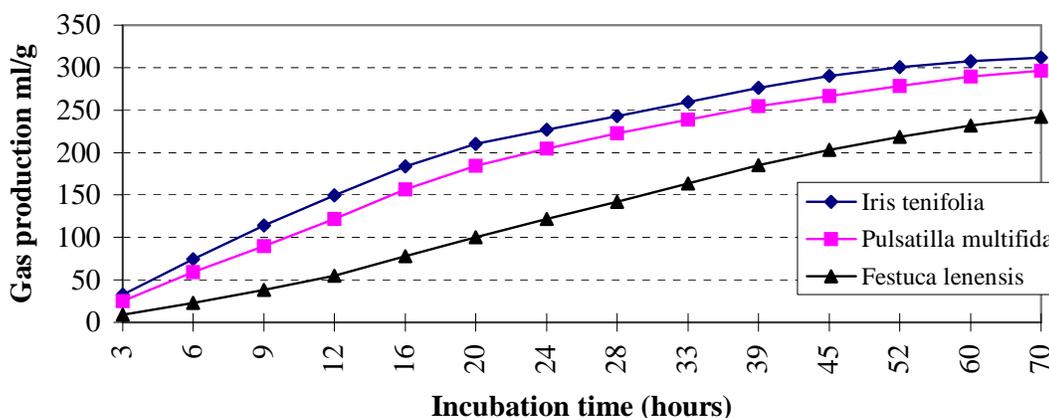
Results and Discussion

According to our investigation, *Pulsatilla's* flower contains sugar 20.33, starch 6.71, cellulose 19.15, lignin 6.50, and ADF 24.88, NDF 32.55, hemicellulose 7.67, and protein 14.27 percent. DMD, OMD of *Pulsatilla multifida* were found 84.35, 84.17%, respectively.

Flowers of *Iris tenifolia* contain sugar 38.89, starch 3.71, protein 18.42, cellulose 9.04, lignin 12.98, ADF 15.60, NDF 19.60 and hemicellulose 4.0 percent. When animals consume early plant flower, its content of soluble carbohydrates will give rise to high overall concentrations of volatile fatty acids in the rumen, due to the rapid rate of fermentation. Dry matter digestibility and OMD of *Iris tenifolia* were found 89.69% and 89.79%, respectively. However, the lignin content of *Iris tenifolia* was higher in comparison with *Pulsatilla multifida*.

Cumulative gas production after 70 hours incubation of flower *Pulsatilla multifida* was 296.45 ml and of flower *Iris tenifolia* was 311.84 ml. Dry matter digestibility and OMD were correlated with gas produced after 70 h. Volume of gas produced over 70 h for the early-plant flowers are presented in Figure1. In Figure1 the gas volume produced by *Festuca lenensis* (standing died) has been included in order to compare. There was a significant ($P < 0.05$) differences between the gas volumes of early plant flowers and *Festuca lenensis* but however, those of the two early-plants were a similar pattern. The volume of gas production produced by early-plant flowers was high in first 24 h, but after 24 h became low caused by high sugar (oligosaccharides) and starch contents.

Figure1



The degradation characteristics obtained by fitting the data of gas production to the exponential equation are presented in Table1.

Table 1. Degradation characteristics

	Parameters			
	a	b	c	a+b
<i>I. tenifolia</i>	-17.9	335.0	0.0557	317.2
<i>P. multifida</i>	-21.7	328.0	0.0483	306.2

Unit: a,b,: ml, c: /h

From Table 1, it can be seen that the potential gas production (**a+b**) and the rate constant (c) values of *I. tenifolia* were slightly higher than that of *P. multifida*. Depending on high soluble fraction of the sample **a** value was negative values.

Conclusions

The nutritive value of flowers of *Iris tenifolia* and *Pulsatilla multifida* is very high. Those could provide energy, protein and various minerals. Use of these species will provide requirements of the rumen micro-organisms, ensure a better fermentation of the spring standing died (khagd) and a higher production of microbial proteins and total volatile fatty acids. Hence, it would allow partial recovery of live weight loss during the winter-spring period, since animals consume the flowers very readily.

References

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ЗАРИМ ЭРТЭЧ УРГАМЛЫН ЦЭЦГИЙН НАЙРЛАГА, ШИМТ ЧАНАР

Д.Даалхайжав

Дүгнэлт

Зун, зун оройн хөгжлийн хэмтэй ургамууд ургаж эхлээгүй, эсвэл ургацын хуримтлал нь бага 4 дүгээр сарын сүүл, 5 дугаар сарын эхээр өндөр уул, ойт хээрд яргуй; хээр, цөлөрхөг хээрд нарийн цахилдаг зэрэг эртэч ургамал энэ үеийн малын тэжээллэгт өндөр ач холбогдолтой.

Хөх яргуй (*Pulsatilla multifida* Juz.)-н бундуйнд үнэмлэхүй хуурай байдалд тооцсоноор саахар 17.67 хувь, цардуул 6.34 хувь, цэцгэнд нь саахар 20.33 хувь, цардуул 6.71 хувь, харин целлюлоз 19.15, лигнин 6.50 хувь, протейн 14.27 хувь, хүчилд уусдаггүй эслэг (ХУЭ) 24.88 хувь, саармаг уусгагчид уусдаггүй эслэг (СУУЭ) 32.55 хувь, геммицеллюлоз 7.67 хувь агуулагдана.

Нарийн цахилдаг (*Iris tenifolia* Pall.) хөгжлийн хэм, найрлага, бог малын хаврын тэжээллэгт гүйцэтгэх үүргээрээ яргуйтай төсөөтэй нь судалгаагаар тогтоогдлоо. Түүний цэцгэнд саахар 38.89 хувь буюу хөх яргуйнаас 1.91 дахин их, цардуул 3.71 хувь, протейн 18.42 хувь, целлюлоз 9.04 хувь, лигнин 12.98 хувь, ХУЭ 15.60, СУУЭ 19.60 хувь, гемицеллюлоз 4.0 хувь агуулагдана.

Хөх яргуйн цэцгийн органик бодисын *in vitro* шингэц 84.17, нарийн цахилдагных 89.79 хувь хүрч, 70 цаг *in vitro* нөхцөлд байлгахад үүсгэсэн хийн бүтээмж нь дээрх дараалалаар 296.45, 311.84 мл/г байна.