Variation in concentration of condensed tannin in sainfoin (*Onobrychis viciifolia*) accessions from a Swiss collection

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INTRODUCTION

Condensed tannins (CT)

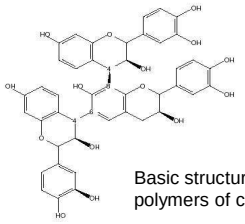
- Are secondary plant metabolites
- They are beneficial if consumed optimally
- They have very diverse & complex structures
- Inter & intraspecies differences have been reported

Sainfoin(*Onobrychis viciifolia*)

- It is a perennial legume with moderate CT content
- There is a resurgence of interest in this legume
- This is due to its nutritional & animal health attributes

HYPOTHESIS

- Different sainfoin accessions vary in type and concentration of CT and environmental factors do influence this variation

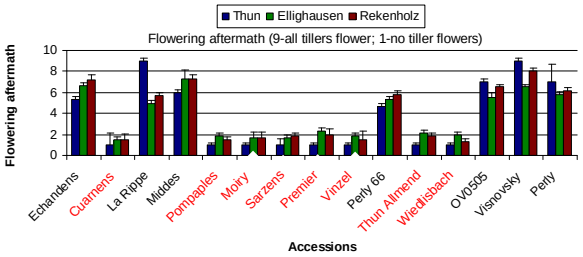


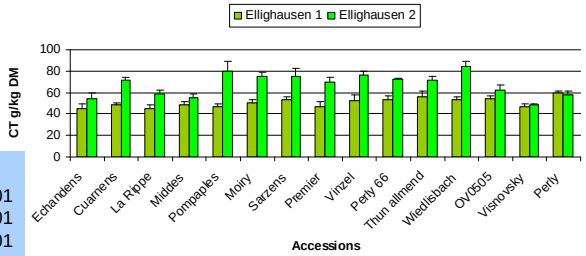
Basic structure of CT-polymers of catechin

MATERIALS & METHODS

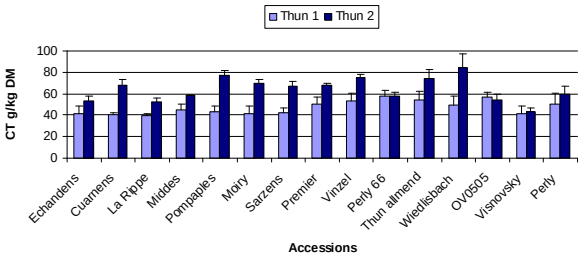
- 15 sainfoin accessions : *10* landraces; *2* ecotypes; *1* breeding line and *2* commercial lines
- Planted in 2007at 3 different sites in Switzerland: Thun (559 m asl), Ellighausen (520 m asl) and Rekenholz (440 m asl)
- Were established on adjacent (1.5 x 6.0 m²) plots as a randomised complete block design
- The agronomic, phenologic and morphologic characteristics of field plants were determined using standard protocols
- Plant material harvested in late May 2008 and early July 2008 as first and second cut respectively and deep frozen
- Samples were lyophilised and ground to pass a 1mm screen
- The butanol/HCl method was used to determine CT in both extractable and bound forms
- A standard was obtained by purification of Visnovsky accession through a column of sephadex
- The data subjected to mixed procedure of SAS and least significant difference (LSD) test for multiple comparison among means

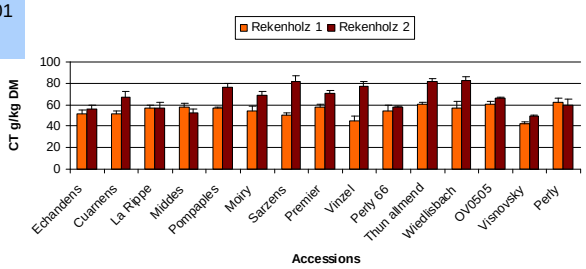
RESULTS





P values	
Accession	<0.001
Site	<0.001
Cut	<0.001
Accession x cut	<0.001
Accession x site	<0.001
Cut x site	<0.001
Accession x cut x site	<0.001
LSDAccession x cut x site	**5.3**





From the phenological data, 2 major groups emerged: single flowering and multiple flowering varieties. CT concentrations clearly varied among accessions and across sites and cuts. Significant interaction were found between accessions, sites and cuts as well. The Visnovsky accession had the lowest CT concentration across all sites and cuts. The highest CT concentrations were found in the leafy regrowth of the Wiedlisbach accession. First cut CT concentrations were significantly lower than second cut CT concentration for Most of the 15 accessions across all 3 sites. Differences in CT concentration were more marked for single flowering accessions compared to multiple flowering accessions.

CONCLUSION

Results of this study show that CT concentration in sainfoin accessions from the Swiss collection vary significantly among accessions, sites and cuts. This indicates that major differences in nutritional value and animal-health related properties may be expected as well.

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