

Fatty acid composition of forage herb species

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Introduction and Objectives

- Herbs can contribute to increased biodiversity in grasslands.
- Data on fatty acid (FA) composition of herbs is scarce.
- FA were examined in four herb species grown in a sward.

Results

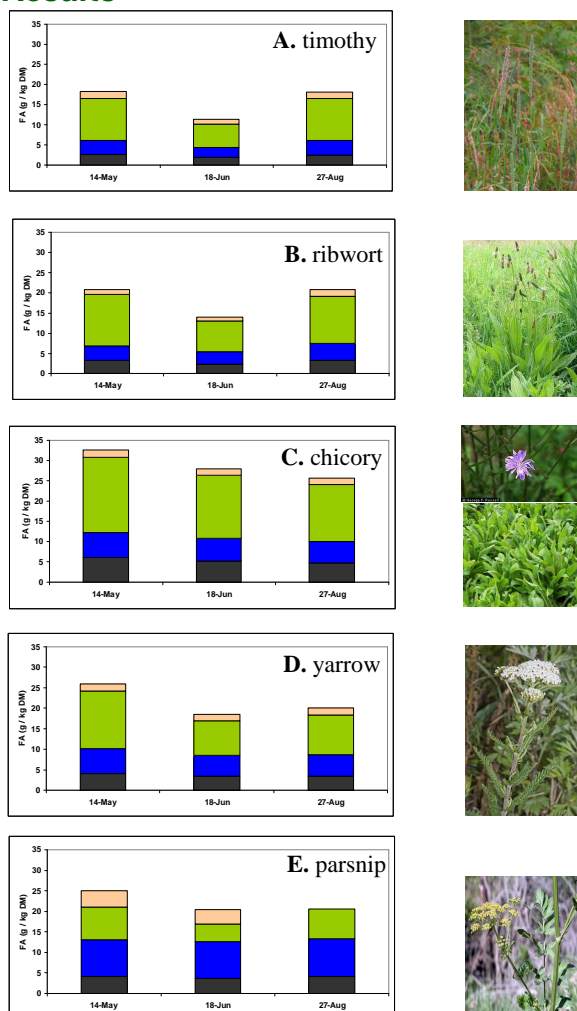


Fig. 1. Content in DM (g kg^{-1}) of C16:0 (black, bottom), C18:2 (blue), C18:3 (green) and minor FA (pink, top) in A. timothy, B. ribwort, C. chicory, D. yarrow, E. parsnip

Materials and Methods

- The experiment was situated on a heavy clay soil near Wageningen, the Netherlands ($51^{\circ}58'N$, $5^{\circ}40'E$).
- Plots were sown in 2003 with monocultures of ribwort (*Plantago lanceolata*), chicory (*Cichorium intybus*), yarrow (*Achillea millefolium*), and a mixture of parsnip (*Pastinaca sativa*) and timothy (*Phleum pratense*).
- Randomized block design, 3 replications.
- Trials were cut in 2007 on 14 May, 18 June and 27 August.
- Samples were frozen (-20°C), freeze-dried and stored.
- FA analysis was performed at Aarhus University in Foulum, Denmark (HCl - Bligh and Dyer).
- Extraction with a mixture of water, methanol and chloroform.
- Esterified to form methyl esters (FAME) which were quantified by gas chromatography with C17 as internal standard (Jensen, 2008).

Discussion

- The three major FA, C18:3, C18:2 and C16:0, were highly affected by the plant species ($P < 0.001$).
- Timothy (Fig. 1A) differed from the herbs in terms of having particularly low levels of total FA, C18:3, C18:2 and C16:0.
- Chicory (Fig. 1C) was highest in total FA and C18:3 concentrations, which is in accordance with the results of Clapham *et al.* (2005).
- Ribwort (Fig. 1B) and yarrow (Fig. 1D) had similar FA levels.
- Parsnip (Fig. 1E) had a unique FA profile with very low concentrations of C18:3 (27% of total FA) and high levels of C18:2 (39% of total FA).
- FA concentrations were generally lower in June after a heavy cut than in May and August.

Conclusions

- There were differences in FA concentrations and FA profile between timothy and herbs, and among herb species.
- Herbs generally had higher FA concentrations than timothy.
- Chicory had higher FA than ribwort, yarrow and parsnip.
- C18:3 was the most abundant FA, except in parsnip.