

# **Variety is the spice of life: Forage species variety in diets of goats increases woody plant and tannin intake**

Piet Monegi, Khanyisile Mbatha, Julius Tjelele and Ntuthuko Mkhize



# Introduction

- Forages
  - ✓ Chemical defences (reduced palatability)
- Behavioural and metabolic means
  - ✓ Diet mixing-detoxification
    - ✓ (Freeland and Janzen 1974; Marsh et al., 2006)
- North America and Mediterranean ecosystems
  - ✓ Nitrogen based PSM vs Carbon based PSM



# Objective

- Determine the effects of diet mixing on the feed intake
- Hypotheses
  - ✓ Single diet vs mixed diet
  - ✓ Mixed diet = higher condensed tannins intake

# Study plant species



*Searsia pyroides* (SP)



*Euclea crispa* (EC)



*Searsia lancea* (SL)



# Materials and methods



Four experimental diets (i.e. 1: SL, 2: SP, 3: EC, and 4: a mixture of all three plant species) were offered to four groups of goats  
Six animals per group

# Materials and methods (cont')



*Searsia lancea*



Extracted Condensed Tannins

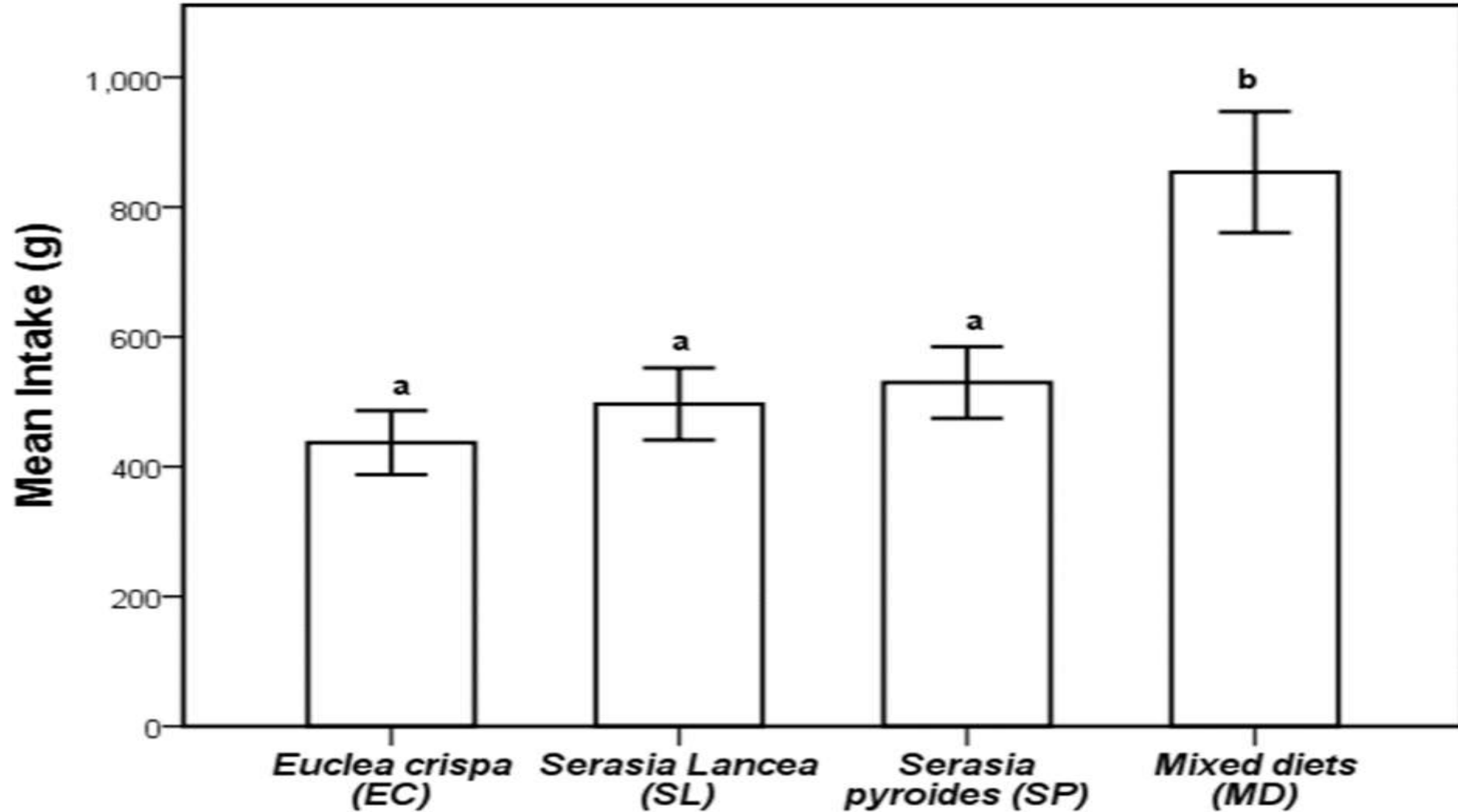


Condensed tannins analysis

# Results

- Condensed tannins concentration (CT), crude protein (CP) acid detergent fibre (ADF), acid detergent lignin (ADL) and neutral detergent fibre (NDF)
  - ✓ *Searsia lancea* (SL) had (CT 2.70%, CP 8.50 %, ADF 21.46 %, ADL 12.50 % and NDF 39.37 %)
  - ✓ *Searsia pyroides* (SP) had (CT 5.20 %, CP 9.03%, ADF 27.07 %, ADL 10.89 % and NDF 40.30 %)
  - ✓ *Euclea crispa* (EC) had (CT 6.44 %, CP 6.19 %, ADF 6.20 %, ADL 16.63 % and NDF 30.02 %)
  - ✓ Combination of SL+SP+EC had (13.02%)

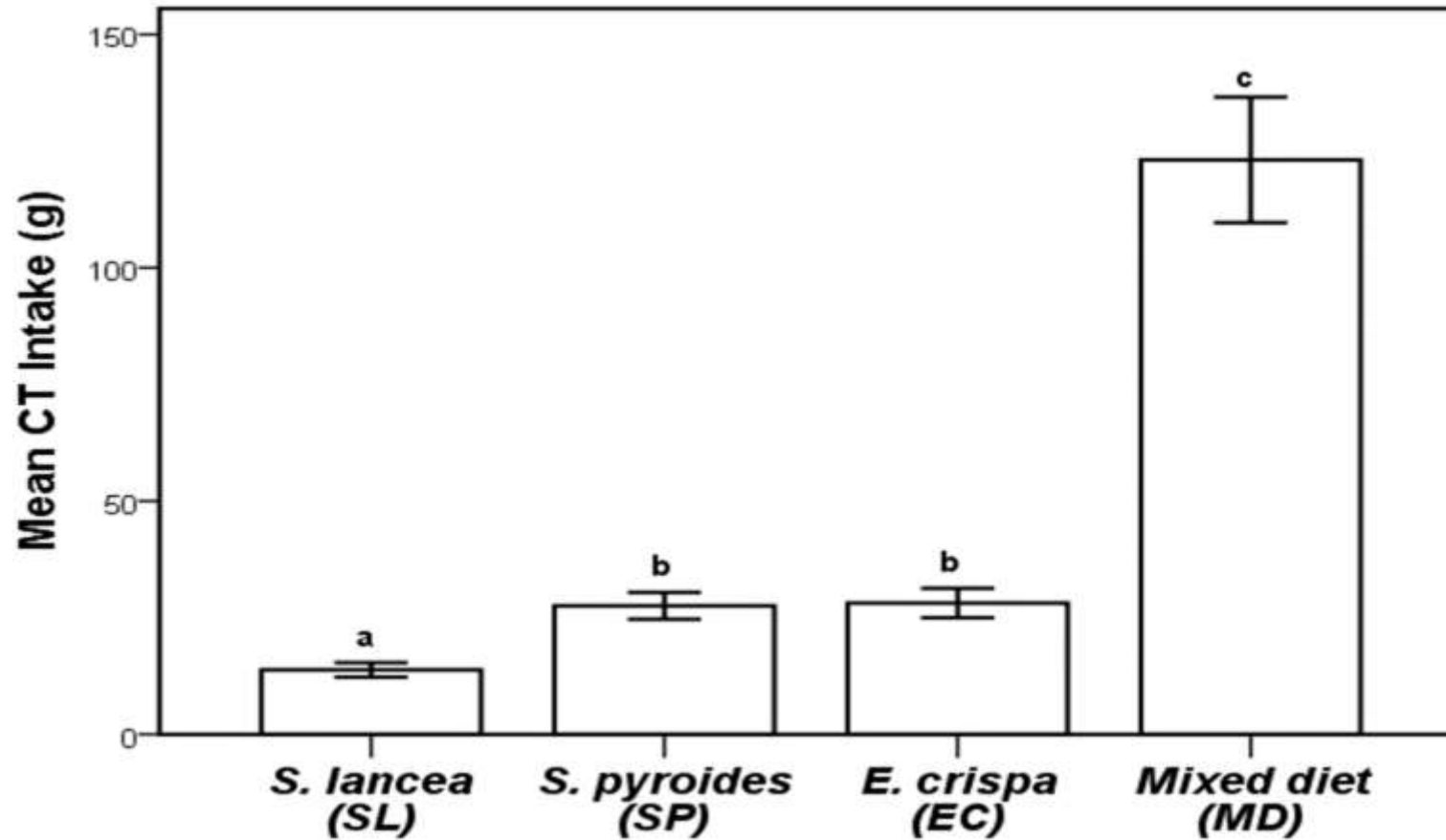
# Results (cont')



ANOVA  
Significance @  $P < 0,05$



# Results (cont')



Differences in condensed tannins intake among four diets (i.e. individual diet vs mixed diets)

Browse intake\*(CT content/100)

# Alternative explanation

Mixed diet was higher in CP; replaced CP that may have been compromised by CT

Feeding strategy changes from minimising CT intake to maximising nutrient intake

# Conclusions

- Mixed diet provides herbivores with chemical diversity that helps cope better with chemical defences
- Monoculture/single species systems may limit intake and compromise nutrition

Thank you!!!!

