

# Risk of introgression in the wild gene pool of *Coffea canephora* in Yangambi (DRC)



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## Introduction

Coffee is one of the most popular beverages in the world. Cultivars of Robusta coffee are derived from the wild species *Coffea canephora*. Their natural gene pool exists in rainforests in the Congo basin and may contain genetic diversity useful for coffee breeding. Therefore, the conservation of these wild genetic resources is of major importance.

## RISK OF INTROGRESSION

- ➡ Cultivated material is grown by local residents in their home gardens near wild coffee populations.
- ➡ Agricultural lands abandoned in the 1960's were reforested, creating an opportunity for persisting cultivars to exchange genetic material with wild coffee individuals.

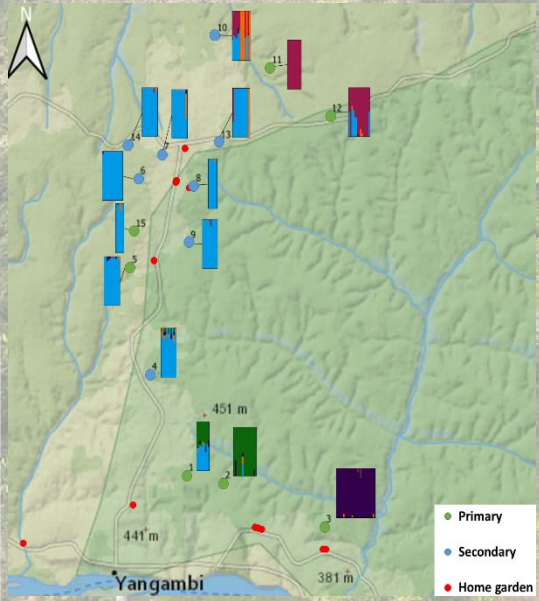
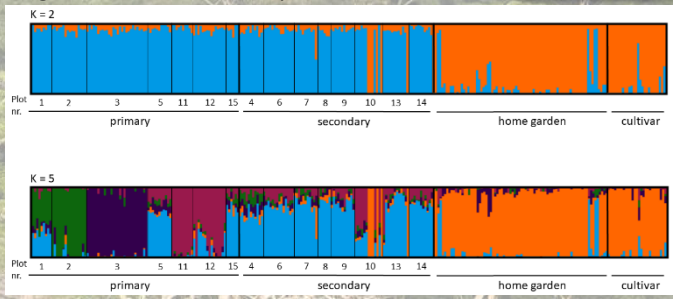


Figure 1: fastSTRUCTURE analysis (K=5).

Figure 2: ADMIXTURE analysis



## Results

- A genetic gradient from the South to the North in the Yangambi region
- Less admixture in primary forest populations than secondary forest populations
- Intermixing of the wild and cultivar genetic identity in the secondary forest populations

## Conclusions

Cultivated genotypes, present in the secondary forest populations, are creating threats for genetic pollution of the intact primary forest populations. The presence of admixed genotypes in secondary forest provides evidence that wild and cultivated individuals are able to exchange genetic material. This suggests that there is opportunity for genetic mixture, creating a risk for introgression and potentially threatening the integrity of the wild coffee gene pool.

## Methods of genetic analysis

- 291 individual *Coffea canephora* trees were sampled:
  - 184 wild samples: 95 from primary and 89 from secondary forest
  - 80 individuals grown in home gardens
  - 27 known cultivars as reference materials
- Genotyping-by-sequencing yielded 7.641 genome-wide SNP markers
- fastSTRUCTURE and ADMIXTURE