

Understanding the genetic diversity of Ethiopian yams



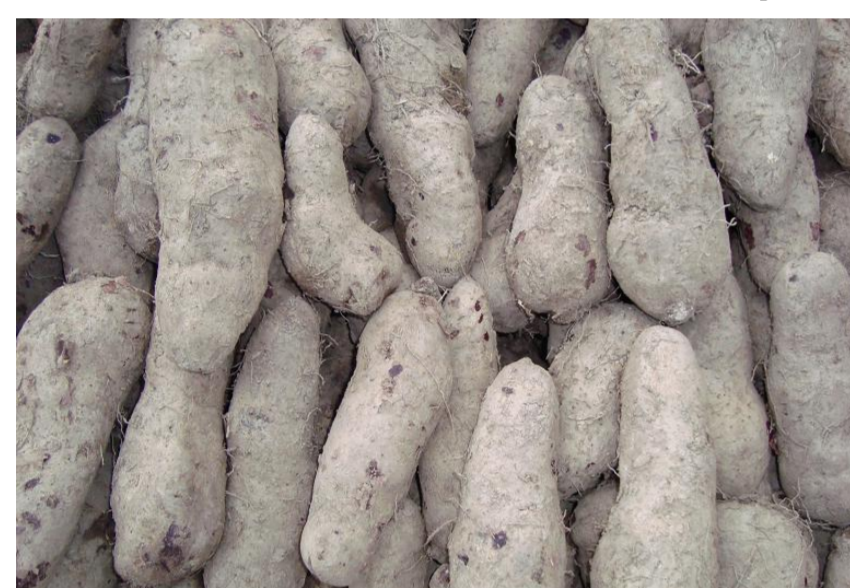
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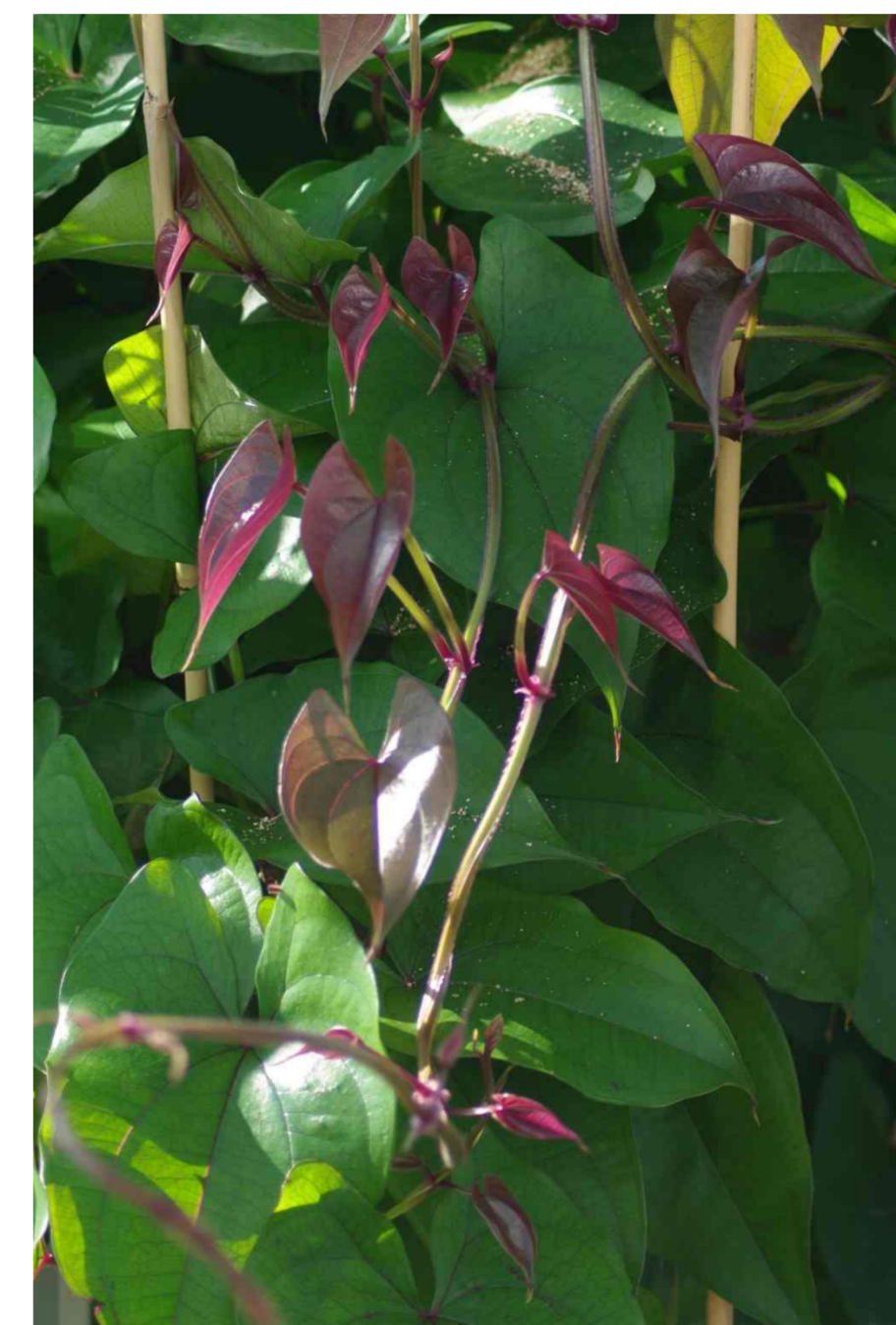
Yam field in SW Ethiopia



Edible tubers

Yams (*Dioscorea* species, Dioscoreaceae) are important crops in the tropics and subtropics and are grown for their edible tubers and medicinal properties.

Ethiopia is an isolated center of yam cultivation in Eastern Africa and the crop plays a vital role in local livelihood in the southern, southwestern, and western parts of the country. Yams also occur in the wild in Ethiopia and farmers directly bring wild material into their home-garden.



Yams in FC glasshouse

D. cayenensis complex, *D. alata* and *D. bulbifera* are cultivated in SW Ethiopia.

Wild *D. bulbifera* is found in SW Ethiopia. *D. praehensilis* and *D. abyssinica* are the other wild species in Ethiopia

The *D. cayenensis* complex was developed through cultivation from the wild *D. praehensilis* and *D. abyssinica*.

Domestication of wild yams (adoptive transplantation) is still practised by farmers in SW Ethiopia.

Ethiopian farmers face constraints with yam production

To develop new varieties with ecological adaptation and resistance to pests and diseases, a better knowledge of the diversity of farmers varieties and their wild relatives is necessary.

Morphological variation

Nuclear DNA content

Variation at molecular level

Flow cytometry was used to estimate nuclear DNA content using Propidium Iodide as fluorescent dye and tomato as internal standard (reference).



Number of nuclei

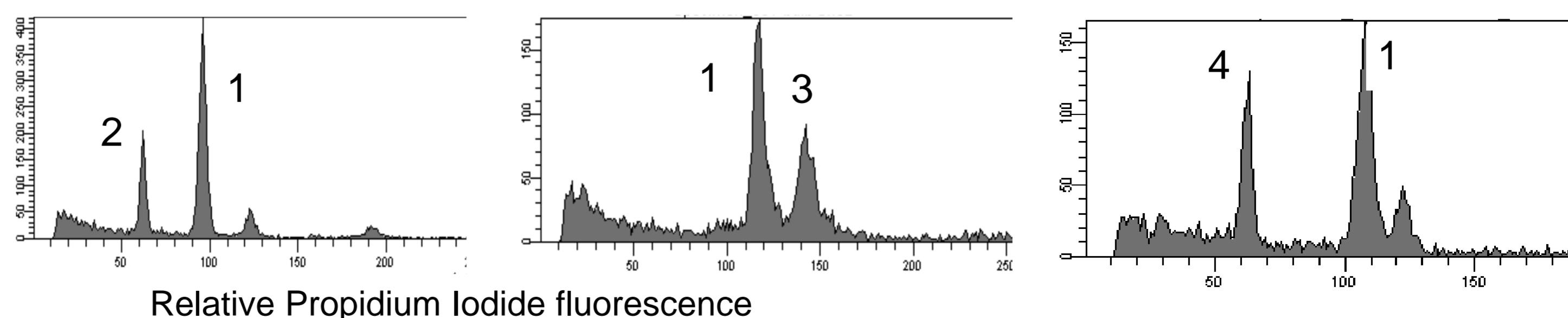


Fig. 3. Histogram from flow cytometric analysis of different species of yams.

1. Nuclei of tomato (2C=1.96 pg).
2. Nuclei of *D. cayenensis* complex (2C=1.25 pg, 4x) ;
3. Nuclei of *D. bulbifera* (2C=2.4 pg, 6x) ;
4. Nuclei of *D. alata* (2C=1.15 pg, 4x)

Phylogenetic, diversity and morphology data on the wild complex are being collected for future introduction work.

Understanding the genetic variation of Ethiopian yams will contribute to the improvement of the crop.