



International Conference

# FROM SEED TO PASTA III

**A SUSTAINABLE DURUM WHEAT CHAIN  
FOR FOOD SECURITY AND HEALTHY LIVES**

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## **CHARACTERIZATION OF ETHIOPIAN GENETIC RESOURCES FOR DURUM WHEAT**

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Ethiopian durum wheat landraces are mostly an untapped resource for wheat breeding, both for Ethiopia and worldwide. In this presentation, I will discuss a long-lasting effort in characterizing the many aspects of their genotypic and phenotypic diversity, eventually promoting their potential for breeding in local and global wheat. We started by characterizing a representative collection of Ethiopian genetic materials coming from different agro-ecologies in the country, observing their marked diversity from the international wheat allele pools. We then characterized the collection for traits of agronomic relevance and for disease resistance in multiple locations in the Ethiopian highlands, and used a genome wide association (GWA) approach to describe novel loci associated with phenology, yield, and Septoria resistance. We involved local smallholder farmers traditionally cultivating wheat, and had them quantitatively evaluate the genetic material for their preference. This approach allowed us to break down farmer appreciation on metric traits, understanding women and men choice processes on local wheat. Smallholder farmers' appreciation was also mapped on wheat genome through GWA, identifying loci responding to farmers' preference that partially overlapped signals from metric traits. We then selected a set of 50 representative landraces bearing traits of interest, and we intercrossed them to an elite wheat genotype to produce a large nested association mapping (NAM) population. The Ethiopian wheat NAM (EtNAM) population is a powerful tool for breeding as well as for mapping of quantitative trait loci (QTL). We genotyped a subset of 1,200 EtNAM lines, phenotyping them in three locations for agronomic and disease resistance traits. I discuss promising results, and propose our integrated method as a mean to empower rapid and efficient uptake of landraces alleles in wheat breeding.

**ABSTRACT**