

Workshop: Assessment of Crops biodiversity – Cultivars and Natural Resources
Professor Khidir Hilu, Virginia Tech, USA

Iraq is one of the three major centers of origin of agriculture. It is, however, the most important center since two of the top crops that feed the world, wheat and barley, were domesticated there. In fact wheat is the most important crop that feed the world. Iraq also is a center of domestication of rye, oats, sweet peas, and a number of other crops including fruit and vegetable crops. As such, Iraq holds extremely valuable genetic resources for these crops in the form of cultivars that have been carefully selected and carefully bred for thousand of years. Further more, we also have in Iraq the wild species from which the crops were domesticated; these populations contain by far more genetic diversity and breeding resources than the cultivars themselves. These genetic resources are highly valuable for breeding worldwide by traditional or biotechnology oriented breeding.

I propose a workshop to discuss global crops, the crops that were domesticated in Iraq and surrounding region, how to catalogue them, the means by which they can be characterized morphologically and ecologically, the use of molecular fingerprinting markers for the identification and classification of the genetic resources, and the importance of bioinformatics in the assessment of genetic diversity. The workshop can be conducted in four days if time allows:

Day 1: Lectures and discussions on world crops and the Iraq domesticate. Statistics will be presented on trends of agriculture, particularly in relation to Iraq. Covered in this day is the current situation of local genetic resources, the global germplasm resources and the role Iraq can play in preserving and protecting its valuable resources will be studied, and ways to fund these important preservation activities.

Day 2: Workshop on the characterization of genetic resources and their classification. Highlighted will be the features that need to be recorded and way to keep the records. Computer programs will be used to display the different ways of grouping the cultivars. A workshop on the use of molecular genetic markers to fingerprint the genetic resources and the application of bioinformatics to assess genetic distances. The molecular part of the workshop will include if possible an actual lab work practice. If that is not possible, then a virtual lab will be presented in the form of computer powerpoint presentation. This workshop will conclude with pointing out potential sources of problems in the molecular biology practice as it relates to fingerprinting and how to spot and solve these problems.

Day 3: The bioinformatics part of the workshop will start with an analysis I will conduct and present on a screen. Then, the participants will conduct an analysis themselves using software I will bring for the workshop. The workshop will discuss the outcome of the analyses in terms of accuracy and biological meaning.

The workshop will be concluded with an overall discussion that aims at proposing concrete steps to achieve a reliable and effective means of collecting, preserving, fingerprinting, and cataloging/classifying our valuable crop genetic resources. The sources of funding these activities will be identified and plans to approach the sources will be put in place. A target date for the next workshop/meeting will be noted.