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Editorial

Special issue: Plant Genetic Resources conservation and utilization – crop wild relatives

Plant Genetic Resources (PGR) have an important role to play to ensure global food and nutrition security. They have provided the foundation for crop improvement ever since agriculture began approximately 12,000 years ago. The paradox is that, while crop yield has expanded significantly over the past centuries, the continued introduction of new varieties and human mismanagement of the environment has threatened the very resource base (local land races and crop wild relatives (CWRs)) upon which its success is based. Today agriculture and food production are facing numerous challenges such as climate change, land degradation, soil impoverishment, pest and diseases epidemics, genetic erosion and so on. These challenges are each negatively affecting the way we are able to produce food in sustainable ways. Daily food security is becoming more and more dependent on the greater breadth of resources found in nature that are themselves being eroded or extinguished.

Increased conservation and use of CWRs is seen to be part of solution to fight these challenges and secure breadth of resources for crop improvement. CWRs are a source adapted genes for addressing biotic and abiotic stresses, as well as other breeding goals and yield and quality improvement. CWR importance to sustaining agriculture has been recognized internationally in Convention on Biological Diversity (Aichi target 13), International Treaty on PGRFA, FAO Global Plan of Action and The Sustainable development Goals (SDG 2- Zero Hunger) and has been valued at more than US$120 billion (PwC, 2013). Despite their economic importance to agriculture and the role they have played in shaping our food crops over centuries, the conservation of CWR remains an underfunded research area, with global 72% of CWR taxa requiring additional *ex situ* collections (Castañeda-Álvarez *et al.*, 2016) and there being no effective *in situ* conservation of CWR populations in nature (Maxted *et al.*, 2016).

However, in the last few decades significant progress toward effective conservation has been made; there is a growing body of work focusing on develop methodologies and tools for the sustainable conservation and use of CWR (Iriondo *et al.*, 2008; Maxted *et al.*, 2008, 2012, 2015, 2016; Iriondo *et al.*, 2012). Numerous projects aiming at developing national or genepool conservation strategies, action plans and gap analysis for CWR conservation have been undertaken in various part of the world. In the recent years we have seen a revival of interest to better understand the diversity, distribution of CWR and gaps in conservation and their threat status. Efforts to prioritize CWR taxa globally (Vincent *et al.*, 2013), then collect and conserve CWR in genebanks is being undertaken at a large scale for priority crops in the world (Dempewolf *et al.*, 2013) and most recently global priority locations for *in situ* conservation have been identified (Vincent *et al.*, 2019). Yet today breeders creation of novel varieties and who are increasingly looking at CWR for adaptive and resistance traits, find crop improvement restrained by lack of CWR germplasm or the necessary characterization information (McCouch *et al.*, 2013).

Therefore, this Special Volume of Plant Genetic Resources, Characterization and Evaluation is very timely as CWR science finally moves beyond the theoretical to the increasing applied, to meet breeders and consumers growing demands. It includes prioritized CWR inventories at different geographical levels viz. national (Bissessur *et al.*, 2019; Dickson *et al.*, 2019), regional (Allen *et al.*, 2019; Fitzgerald *et al.*, 2019) levels. Tools to facilitate conservation planning have also been developed (Magos Brehm *et al.*, 2019; Holness *et al.*, 2019), and regional conservation strategies and approaches have been developed (Allen *et al.*, 2019; Kell *et al.*, 2016).

Many of the papers included in this special issue are focused on CWR conservation in Southern Africa, a region where agricultural production is often stressed to climate change, is predicted to have a significant deleterious impact, so improving CWR conservation could make the difference between food insecurity and security for millions. The work is undertaken within the ACP-EU funded project '*In situ* conservation and use of crop wild relatives in three ACP countries of the SADC region' (SADC Crop Wild Relatives project) (http://www.cropwildrelatives.org/sadc-cwr-project/) and implemented through the ACP-EU Co-operation Programme in Science and Technology (S&T II by the ACP Group of States (grant agreement no. FED/2013/330-210)). Work in

this region is complemented with CWR studies from other regions (Contreras-Toleda *et al.*, 2019; Fitzgerald *et al.*, 2019; Philips *et al.*, 2019; Tas *et al.*, 2019).

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