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"Resilience of agricultural systems against crises"

Linking Indigenous Knowledge System and Molecular Genetic Analysis for Management and Conservation of Enset (*Ensete ventricosum*), a Food Security Crop in Southern Ethiopia

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Abstract

Intra-specific diversity of neglected and underutilised crop species (NUS) is a key element in resilience of smallholder-based agricultural systems and farmer's livelihood strategies in many developing countries. There has been growing call for inventories and integrated methods evaluating utilisation, diversity and distribution of NUS, especially in context of the changing farming systems. The enset crop in indigenous enset-based farming systems of Southern Ethiopia plays an ecological, economical as well as a food and nutrition security role for over 15 million households in the region. We are applying an interdisciplinary approach which combines indigenous knowledge system (IKS), molecular genetic analysis (MGA) and geographic information system (GIS) to investigate socio-cultural values, level of genetic diversity and geographic distribution of enset (*Enset ventricosum*) landraces cultivated in 12 communities of Wolaita and Gamogofa Zones in southern Ethiopia. Cultural use values, local management practices, farmer's unit of diversity (FUD) and descriptors of landraces were documented and *de novo* microsatellite markers were developed using next generation sequencing and data mining approaches. The application of this interdisciplinary approach is anticipated to highlight on (i) current use status and potential benefit of enset genetic resources; (ii) extent and eco-geographic distribution of enset landraces across communities and landscapes; and (iii) detailed prioritisation of community centred *in situ* conservation areas (microcentres of conservation) for enset agrobiodiversity. The methodological approach utilised in the study and the molecular tools developed imply the multi-functionality of integrated approaches for conservation and improved utilisation of crop genetic resources in general and NUS crop species such as enset in particular.

Keywords: Biodiversity conservation, Enset, Ethiopia, indigenous knowledge system, molecular genetic analysis, neglected and underutilised species

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