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Ecological Genetics and Genomics

Agricultural Genetic Resources in Sri Lanka

Unveiling the possible floral visitors and invisible pollination networks from Deep RNA-seq Profile

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ABSTRACT

Floral visitors are key components of success monitoring, limits our understanding of the and quantification of floral visitors may reveal knowledge of entomology and taxonomy. revolutionized traditional analytical method the salivary glands, muscle cells, and secretions collected with flowers contain in this, we present a workflow from freely available hypothesis that a small amount of Illumina assembled the workflow using deep Illumina observations. The workflow was also valid



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CONTRIBUTED PAPERS

Tropical and subtropical Asia's valued tree species under threat

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Review
Cinnamon: A Natural Feed Additive for Poultry Health and Production – A Review
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Review Article
Identification of superior Cinnamomum blume germplasm for future cinnamon breeding in the world

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Wasantha Kumara Lyanage^f ✉

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RESEARCH ARTICLE

Universal breeding regions not discriminated

C. H. W. M. R. Bhagya C
D. Siril A. Wijesundera, I

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Unique AGR in Sri Lanka AGR Resource Pool Documented Gene banks established Protected area network established Capacity for research

D.K.N.G. Pushpakumara
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Abstract

Sri Lanka has an extensive diversity of agro-ecosystems, in agriculturally important species and also in genetic groups representing commercial and traditional varieties. Agro-ecological variations, socio-cultural diversity, diverse agricultural practices and other socio-cultural factors and introductions have contributed to the agro-biodiversity of the country. As in many parts of the globe, in Sri Lanka too, the agro-biodiversity is being domesticated, developed and actively managed by its community. Agricultural genetic resources (AgGRs) of Sri Lanka consist of rich diversities of plants including rice, other cereals, pulses and oil seeds, roots and tuber crops, fruits and vegetables, spices and condiments, plantation crops, ornamental and medicinal plants, agroforestry and timber trees, as well as animal species including cattle, buffalo, goat, poultry, sheep and pig. The country also consists of a rich diversity of wild relatives of crop plants, poultry, buffaloes and pigs as well as pollinators, pests, pathogens, predators, parasites, and soil biota. Investigations so far indicate high levels of threat to genetic and species diversities of agro-biodiversity due particularly to replacing local landraces, traditional varieties and breeds with new high yielding varieties/breeds. Sustainable use of genetic resources is suggested as a mechanism for effective conservation of AgGRs. Characterization of traditional varieties and accessions of AgGRs, *ex situ* conservation of genetic resources including wild relatives, and assessment of ecosystem services of agricultural biodiversity in the country have been identified as key areas where gaps exist in managing AgGRs. Potential of biotechnology as a tool in utilization of agro-biodiversity for agricultural development, and new developmental avenues are suggested as mechanisms for sustainable use of AgGRs.

AGRO-BIODIVERSITY OF SRI LANKA

Agro-biodiversity can be defined as the diversity of plants, animals and microorganisms that are used directly or indirectly for food and agriculture. It

the environment, genetic resources and management systems, where culturally diverse people attempt to optimize production in different ways. The country's agro-ecological diversity, its biogeography, geographical location and cultural diversity, coupled



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Conditions, Trends and Prospects

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Convention on Biological Diversity

52

SUSTAINABLE USE OF BIOLOGICAL DIVERSITY IN SOCIO-ECOLOGICAL PRODUCTION LANDSCAPES

Background to the 'Satoyama Initiative for the benefit of biodiversity and human well-being'

2010
CBD
UNEP
UNITED NATIONS ENVIRONMENT
UNEP-FAO
Ministry of the Environment

ISSUES IN AGRICULTURAL BIODIVERSITY earthscan from Routledge

Tropical Fruit Tree Diversity

GOOD PRACTICES FOR *IN SITU* AND ON-FARM CONSERVATION

EDITED BY
Bhuwon Sthapit, Hugo A. H. Lamers, V. Ramanatha Rao and Arwen Bailey

Issues Related to AGRs

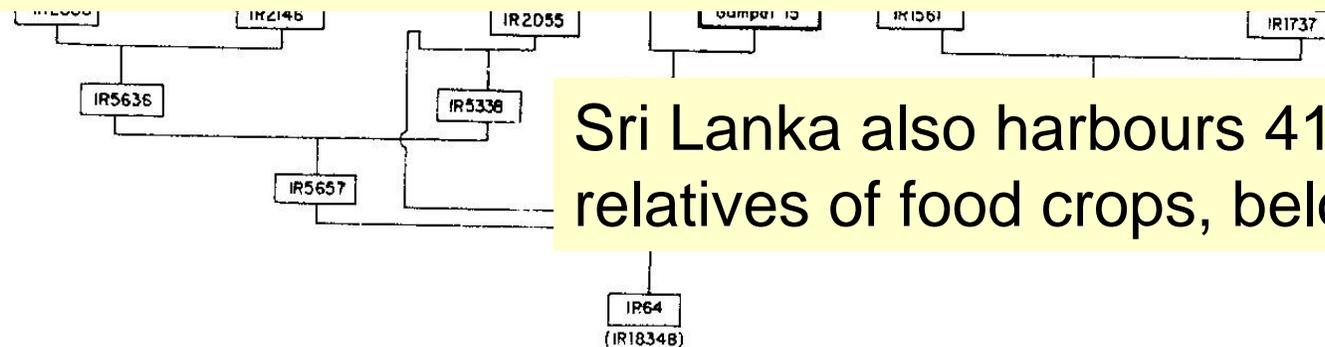
- **Continuity of Government Investment on AGR for both Conservation & Use**
- **Promotion of Private Sector Investments**
- **International Collaboration for Funding and Knowledge Sharing (Process)**
- **Lack of Awareness (investors and stakeholders)**
- **Policy and Regulatory (complexity of AGRs and Access, BS, IPR)**
- **Potential of Returns and Socio-Economic Benefits of Investing in AGRs**
- **Research Priorities and Poor Research Coordination (Institutes, Researchers)**

Assessment & Monitoring Requirements

Morphological, genetic and chemical characterization of species

Genes responsible for traits
for breeding (drought, P & D etc)
for functional properties (nutrient)

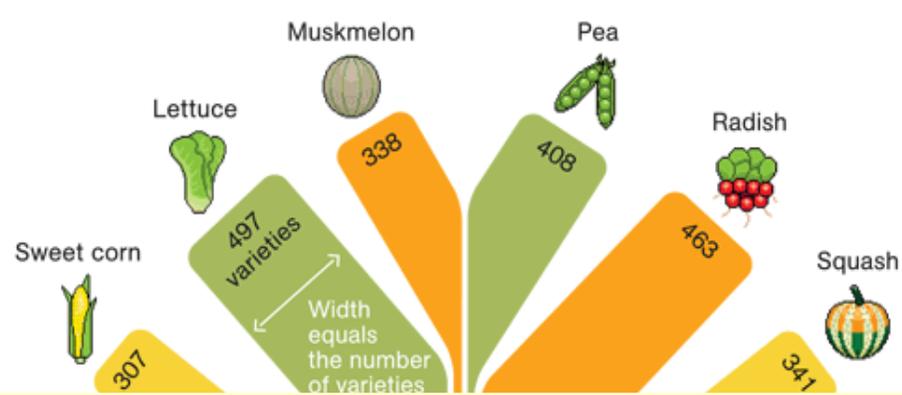
Quality of AGR in conservation



Sri Lanka also harbours 410 species of wild relatives of food crops, belonging to 47 families

□ = Parents
■ = Ultimate land races

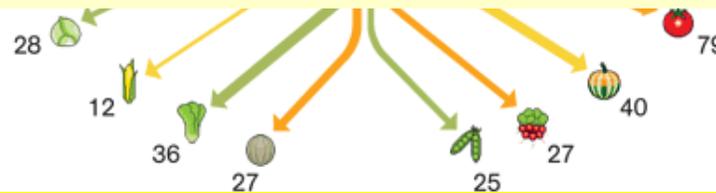
Century
Ago



Assessment & Monitoring Requirements

Existence of genes, species and populations
Level of conservation of AGR
Quality of conserved AGRs

later



Loss of agricultural genetic resources means loss of opportunities.

Advocacy and Policy Issues

- **Enabling Policy to Access to GRs and Benefit-Sharing Clear regulations will help prevent unauthorized exploitation and ensure fair and equitable sharing of benefits**
- **Clarifying laws on plant variety protection, patents, and related rights can ensure that traditional knowledge is respected, and local communities are not marginalized**
- **Collaboration between researchers, farmers (custodian farmers), and industry stakeholders can facilitate the development of improved crop varieties and sustainable agricultural practices.**
- **Institutional Coordination and International Cooperation**

Investment Opportunities

- **Infrastructure, technology, and expertise required for effective seed storage, conservation and access to AGRs (both Public & Private)**
- **Public-Private partnerships to accelerate the development and dissemination of improved crop/animal varieties/breeds, ensuring farmers have access to improved varieties that are adapted to local conditions (MICH Chilli) (P & P)**
- **Cutting edge collaborative, transdisciplinary biotech research to harness the full potential of agricultural genetic resources (PPP)**

Investment Opportunities

- **Bioprospecting & commercialization of value-added product development utilizing agricultural genetic resources (functional foods, nutraceuticals, and herbal products that capitalize on the unique properties of Sri Lanka's agricultural biodiversity (Arabica Coffee/Ceylon cinnamon) for both domestic and export markets (PPP)**
- **Eco-friendly resorts, nature trails, and agricultural heritage sites can attract tourists interested in experiencing the country's unique flora and fauna (promote sustainable use and conservation) (Private / Public)**
- **Capacity building and education programs to ensure the development of a competent workforce (Private / Public)**
- **Educational campaigns and public forums to engage stakeholders, farmers, and local communities in understanding the significance of agricultural genetic resources and their sustainable management (PPP)**

Thank you