

Global strategy for the conservation and use of eggplants: summary for ITPGRFA stakeholders

This document is a concise summary of the [Global Strategy for the Conservation and Use of Eggplants \(Solberg et al. 2022\)](#). This summary supports decision making by the stakeholders of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) by providing evidence-based information in an accessible format.

Annex I crops: common eggplant (*Solanum melongena* L.), scarlet eggplant (*Solanum aethiopicum* L.) and gboma eggplant (*Solanum macrocarpon* L.)

International collections: World Vegetable Center

Composition and gaps in *ex situ* collections

Globally more than 19,000 accessions of eggplants and Crop wild relatives (CWRs) of eggplants are conserved in at least 115 collections. The most frequently represented species is *S. melongena* (brinjal eggplant) with more than 12,000 accessions. This is followed by scarlet eggplant

(*S. aethiopicum*) with 886 accessions and gboma eggplant (*S. macrocarpon*) with 209 accessions. Several of the eggplant CWRs are not conserved at all, and of the 18 priority taxa, five species have fewer than 50 accessions conserved *ex situ*.

Analysis of the geographical origin of *ex situ* collections suggests that landraces from Africa are a gap in *ex situ* collections. Southeast Asia and the Caribbean are also not well represented in *ex situ* collections. Considering the incompleteness of passport data, and that some important collections do not publish their accession data on Genesys and WIEWS, it is possible that the gaps mentioned above may be information gaps rather than collection gaps.

Key metrics	Data source	Value	%
Estimated global number of accessions <i>ex situ</i>	Genesys (2021), WIEWS (2021), and Survey ¹ (2021)	19,154	
Estimated global number of accessions <i>ex situ</i>	Survey (2021)	15,892	
Estimated global number of accessions in the MLS	Plants that feed the world study ²	10,349	54%
Global number of accessions notified as available in the MLS	GLIS portal (2024)	4554	24%
Accessions with DOI	GLIS portal (2024)	6248	33%
Number of accessions safety duplicated at Svalbard Global Seed Vault	SGSV web portal (2024)	3,788	20%
Number of samples distributed per year nationally and internationally	Survey (2021)	1,224	6%
Passport data completeness index: median value in Genesys (Range 0-10)	Genesys (2024)		5.9

¹Responses to the online survey conducted in 2021 were received from 27 genebanks.

²Estimate based on country of institute and ITPGRFA party status. Source Khoury et al. (2023)

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Routine operations, quality management system and safety duplication

63% of the surveyed genebanks have seed storage conditions that are appropriate for long-term storage, versus 22% that do not. The remaining 15% did not respond to this question. Initial viability tests are conducted in 70% of the surveyed genebanks, while the period between successive viability tests varies among institutions.

Most of surveyed genebanks have safety duplicated at least some part of their collection but the percentage of the material duplicated varies largely. 3,283 accessions of common eggplant (*Solanum melongena* L.), 224 accessions of scarlet eggplant (*Solanum aethiopicum* L.) and 82 accessions of gboma eggplant (*Solanum macrocarpon* L.) are safety duplicated at the Svalbard Global Seed Vault.¹

Documentation and information systems

70% of the surveyed genebanks have made passport data publicly available online, about 19% have made phenotypic data publicly available online and only 7% have made genetic data publicly available.

Crop descriptors

The majority of survey respondents reported that they use some form of standardized method for characterization. The Bioversity International (formerly IPGRI) descriptor list for eggplants was the most common reference, but other references included the UPOV descriptors for eggplant, the minimum descriptor list from the ECPGR Working Group on Solanaceae and institutions' own descriptor lists. For example, the collection in India uses the minimal descriptors of Agri-Horticultural Crops published by ICAR-NBPGR.

Human and financial resources

Many of the collection holders reported that shortages of funds and staff are major threats to collection viability and security.

Distribution and obstacles to use

Most of the genebanks distribute material, and, with the exception of two genebanks, the large majority of accessions is distributed nationally. 52% of the surveyed genebanks reported using an SMTA to distribute eggplant material. Most collections distribute fewer than 10 accessions per year. The WorldVeg international collection distributes the most accessions, because it includes seed kits distributed to African small-scale farmers. Constraints to distribution include access to relevant expertise, and plant health issues, with seed-borne diseases such as viroids and viruses hindering distribution.

Partnerships and networks

The surveyed genebanks reported participation in G2P-SOL and the ECPGR Solanaceae working group.

Recommendations and priorities

- Establish a global eggplant working group with representatives from key collection holders and from breeding and research institutions. This group will be responsible for the progress in implementing key activities for a global eggplant collection.
- Develop an Eggplant Knowledge Platform. The platform could be a web page and should include management practices such as regeneration protocols for CWR, seed treatments and contact information for ongoing projects or activities involving eggplants.
- Improve passport data accuracy and completeness in the collection holders' databases to facilitate large-scale gap identification and screening for duplicates within and among genebanks.
- Facilitate and encourage collaborative plant health-related activities and develop a framework of protocols and management practices to address and reduce the risks associated with seed-borne diseases, including viruses and viroids.
- Support collaborative activities associated with accession regeneration and safety duplication to reduce backlogs and help to make all accessions available to users.
- Characterize the global eggplant collection morphologically and genetically to enhance the use of the collection and make a global core collection of brinjal eggplant.
- Encourage collaborative efforts to involve CWR in breeding programs, including the screening of CWR for useful traits in pre-breeding. This activity will seek support from public-private partnerships with long-term commitment and funding.

Bibliography

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¹Data updated through a search on SGSV seed portal on 20 December 2023.