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A REVIEW

Germplasm conservation of mulberry (*Morus* spp.): A review on synthesis of *Ex situ*, *In situ* and molecular strategies for climate-resilient sericulture

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Abstract : Mulberry (*Morus* spp.) is the only foliar host of the domesticated silkworm, *Bombyx mori* L. and therefore forms the biological base of mulberry sericulture across much of Asia. At the same time, the genetic diversity available for future improvement is under pressure from expansion of monoculture, habitat loss and changing climatic conditions. India provides an important case because it holds a large ex situ mulberry collection at the Central Sericultural Germplasm Resources Centre (CSGRC), Hosur. This review brings together about five decades of work on mulberry conservation, characterisation and utilisation, with emphasis on what the different approaches can actually resolve and where their limitations lie. Morphological, cytological, biochemical and DNA-based approaches are compared, ranging from isozymes and RAPD/ISSR/SSR/DAMD markers to retrotransposon-based markers and whole-genome resequencing. The review also compares field genebanks, in vitro conservation, cryopreservation, on-farm conservation and in situ approaches in relation to the biology of mulberry as a highly heterozygous, vegetatively propagated outbreeder for which conventional seed storage is unsuitable. The evidence points to two important gaps in the Indian system: the lack of a validated core collection and the absence of a documented off-site safety duplicate. Studies on biotic and abiotic stress tolerance are also difficult to compare because they differ in sample size, salinity thresholds and experimental design. Based on these findings, the review discusses core-collection development, cryobanking, genomic approaches, FAIR data management and protection of wild Morus populations. The conclusions are limited by the indexed, largely English-language literature available and by the methodological differences among the primary studies, which do not permit a formal meta-analysis.

Key Words : *Morus* spp, Germplasm conservation, *Ex situ, In situ* conservation, Molecular characterisation, Core collection, Sericulture, Climate resilience

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