AIE-06003SI: Evaluation of silkworm genetic resources of *Bombyx mori* L. with reference to inbreeding depression and their conservation

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Introduction:

During the silkworm germplasm conservation, continuous inbreeding makes the populations of each accession more homozygous, but leads to loss of unique and valuable genes through the process of inbreeding depression. Hence, it is essential to maintain a minimal degree of heterozygosity within the population of each silkworm accession, especially in the traditional geographic strains, to avoid such loss. As a result, accurate estimation of genetic diversity is becoming more important in silkworm genetic resources conservation, because minimal amount of heterozygosity in each silkworm strain is essential for better conservation by avoiding inbreeding depression.

Objectives:

- To evaluate silkworm genetic resources and estimate the level of inbreeding depression.
- To promote utilization of sericultural germplasm for crop improvement programmes.
- To maintain national database on silkworm accessions and catalogue the data generated.

Outcome:

In the study, the IBD analysis for 369 bivoltine and 83 multivoltine germplasm resources revealed that 37 bivoltine as well as 12 multivoltine accessions were found to be with moderate to high IBD%. This indicates that, due to inbreeding other silkworm accessions also should not get affected because high IBD% leads to deterioration of traits of the individual accessions which in turn will affect the silkworm germplasm conservation.

Bivoltine accessions under medium and low cluster with (-) ve IBD% in 2020-2022

#	Accession	IBD%	#	Accession	IBD%	#	Accession	IBD%	#	Accession	IBD%
1	BBE-0201	-6.66	**11**	BBE-0019	-2.02	**21**	BBE-0222	-0.35	**29**	BBI-0207	-1.75
2	BBE-0189	-5.20	**12**	BBE-0143	-2.00	**22**	BBE-0261	-0.30	**30**	BBI-0093	-1.01
3	BBE-0177	-2.67	**13**	BBE-0173	-1.99	**23**	BBE-0160	-0.20	**31**	BBI-0355	-0.96
4	BBE-0232	-2.53	**14**	BBE-0168	-1.84	**24**	BBE-0252	-0.07	**32**	BBI-0377	-0.84
5	BBE-0167	-2.45	**15**	BBE-0176	-1.82	**25**	BBI-0141	-4.16	**33**	BBI-0254	-0.69

6	BBE-0288	-2.37	**16**	BBE-0036	-1.38	**26**	BBI-0235	-2.92	**34**	BBI-0353	-0.58
7	BBE-0175	-2.21	**17**	BBE-0192	-0.75	**27**	BBI-0208	-2.81	**35**	BBI-0286	-0.42
8	BBE-0190	-2.19	**18**	BBE-0042	-0.46	**28**	BBI-0303	-2.09	**36**	BBI-0249	-0.26
									37	BBI-0243	-0.04

Multivoltine accessions under medium and low cluster with (-) ve IBD% in 2020-2022

#	Accession	IBD%
1	BMI-0082	-9.71
2	BMI-0077	-6.07
3	BMI-0078	-5.66
4	BMI-0079	-4.76
5	BME-0047	-3.87
6	BMI-0083	-2.28
7	BMI-0081	-1.26
8	BMI-0071	-1.14
9	BMI-0074	-1.09
10	BMI-0076	-1.09
11	BMI-0080	-0.41
12	BMI-0016	-0.40

Recommendations/Utilization:

It is understood that the inbreeding study can be taken up in the silkworm germplasm conservation once in a five years so as to screen if any accession are showing moderate to high IBD% so as to take precautionary measure by giving attention to such accessions.