Project code & Title: AIE-06002MI - Evaluation of bivoltine silkworm genetic resources for tolerance to abiotic stress in selected hotspots

Period: April'2019 to March'2022
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Introduction: CSGRC Hosur being the exclusive repository of 369 bivoltine accessions, the centre is mandated to maintain, characterize and evaluate the silkworm genetic resources (SWGRs) for identification of better performing breeds which is a continuous process. Many of the bivoltine accessions have been evaluated under various programs, best performers identified and recommended. In light of current rapid vagaries of climatic changes, regular screening of available bivoltine germplasm resources under various abiotic stress conditions is the need of the hour. In this context, it is proposed to screen selected bivoltine accessions and identify accessions tolerant to high temperature using SSR markers identified for thermo tolerance. Based on the screening results, around 10 promising bivoltine accessions with marker linked to thermo tolerance and better economic traits will be selected and evaluated under different agroclimatic conditions *viz*. **Tropical -High temperature and low humidity under RSRS, Jammu and REC Chitradurga**; **Sub tropical - High temperature and high humidity under RSRS Jammu and Temperate under CSRTI, Berhampore**. The identified better bivoltine performers tolerant to abiotic stress will be recommended so as to provide wider choice for breeders to include in breeding programs aimed at development of improved hybrids for commercial use.

Objectives:
1. To screen and select bivoltine germplasm resources with presence of markers linked to thermo tolerance.

2. To evaluate selected bivoltine germplasm resources against abiotic stress and identify suitable bivoltine breeds to target selected hot spots

Outcome: The present study shows that the larvae to strive for their survival against the abiotic stress environment deplete much of their energy resources in maintaining homeostasis ultimately influencing quantitative and qualitative traits adversely. It can be concluded that exposure of late instar silkworm larvae to variations in temperature and humidity (above 25 ± 1°C and below 70% RH) affects pupation rate. The study revealed that the larval mortality

resulted when larvae were exposed to higher temperature (30 and 35°C) and lower RH (55 and 65%). The outcome of the present study indicates that the expression of performance of bivoltine accessions is different in three different abiotic stress conditions which show that the silkworm rearing expression performance is influenced by environmental factors. Based on the data and analyzed results of the test centres clearly revealed the better performing oval and dumbbell bivoltine accessions

Table: Centre wise better performing oval and dumbbell bivoltine accessions

CSR&TI, BERHAMPORE	RSRS, JAMMU	REC, CHITRADURGA	CSGRC, HOSUR
Dumbbell bivoltine accessions			
BBI-0338(DD-1)	BBI-0336 (APS-8)	BBI-0334(APS-4)	BBI-0336 (APS-8)
Oval bivoltine Accessions			
BBI-0301(YS-7)	BBI-0339(DD-2)	BBE-0184(SMGS-2)	BBI-0339(DD-2)

Recommendations/Utilization:

The identified bivoltine accessions may be taken as breeding source material so as to make the breeding programme for abiotic stress environment viz. high temperature and low humidity and moderate temperature and high humidity conditions. The following accessions can be utilized for single hybrid and double hybrid preparation for commercial utilization in the respective regions.

OVAL BIVOLTINE ACCESSIONS : BBI-0301[YS-7], BBI-0339[DD-2], BBE-0184[SMGS-2]

DUMBELL BIVOLTINE ACCESSIONS : BBI-0338[DD-1], BBI-0336[APS-8