

## Development and maintenance of isofemale and inbred lines of susceptible insect pest

### Background

Development and continuous maintenance of susceptible insects in the laboratory is a pre-requisite for undertaking studies on insecticide/ biopesticide bioassays, and evaluation of plant germplasm, segregating breeding material, mapping populations, and transgenic plants for resistance to insects. For successful rearing of insects in the laboratory, there is need for developing a easy and cost effective method of rearing on a semi-synthetic diet / on the most preferred host plant / surrogate host that supports survival and development of the insect for several generations. Pest insect cultures derived from a single female (Iso-female lines) were established for cotton pink bollworm, *Pectinophora gossypiella*, brinjal shoot and fruit borer, *Leucinodes orbonalis*, tomato pin borer, *Tuta absoluta*, maize fall armyworm, *Spodoptera frugiperda* and legume podborer, *Maruca vitrata*.

### Details of parental and the iso-female colonies

No	Insect name	Place and date of collection of parental colonies	Rearing method	Date of creation of iso-female colonies and NBAIR accession no.
1	Cotton bollworm, <i>Pectinophora gossypiella</i>	Raichur, Karnataka 23.10. 2009	Semi synthetic diet	07.05.2013 NBAIL-MP-GEL-02a
2	Brinjal shoot and fruit borer, <i>Leucinodes orbonalis</i>	Bangalore Rural, Karnataka 15.09.2012	Plant host	05.02.2013 NBAIL-IS-CRA-01a
3	Tomato pinworm, <i>Tuta absoluta</i>	Rayakottai, Tamil Nadu 10.11.2014	Plant host	15.12.2014 NBAIL-MP-GEL-02a
4	Maize fall armyworm, <i>Spodoptera frugiperda</i>	Chikkaballapur, Karnataka 01.09.2018	Semi synthetic diet	06.10.2018 NBAIL-MP-NOC-05a
5	Legume podborer, <i>Maruca vitrata</i>	Hessarghatta, Bangalore, Karnataka 30.09.2020	Semi synthetic diet	14.10.2020 NBAIL-IS-CRA-02

### **Benefits/Utility**

These iso-female and inbred lines are served as a good source for further development into pure inbred lines that are homozygous at every locus and the alleles at each locus are identical by descent. Such pure inbred colonies are in huge demand in comparing the molecular mutations and gene duplications associated with insecticide resistance in insect pests.

### **Scalability**

Not applicable

### **Target market customer**

- Students, Researchers and corporates involved in development and screening of germplasm and insecticidal molecules and into genomics research

### **Social impact of the technology**

- The inbred lines or iso-female lines are valuable starting point for developing novel pest management strategies.
- For example, the integration of knowledge on genetics and genomics is necessary to study the QTLs and other segregating traits where the inbred lines play an valuable tool to study the gene interactions with the environment.