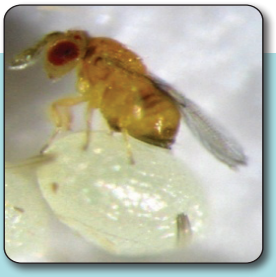
High temperature tolerant strain (HTTS) of egg parasitoid *Trichogramma chilonis*



HTTS of *T. chilonis* adult

Technology Description

Trichogramma chilonis, commonly known as mini wasp, is an egg parasitoid of lepidopteran pests. The strain, HTTS, developed at ICAR-NBAIR, is tolerant to high temperature (32-40°C), therefore, can be used efficiently by farmers in high temperature regions. Once emerged, these parasitoids would parasitize eggs of the most of the lepidopteran pests, such as sugarcane borers, cotton bollworms, corn borers, rice stem borer and leaf folder etc. The parasitoid can be used as a living, "biological insecticide" that strikes only the target pest with no risk to other natural enemies, human health or the environment.

Background

Agricultural productivity in India is affected largely by insect pests and diseases, which cause losses to the tune of 10-30%. Though there has been increasing awareness in India about the hazards of indiscriminate use of insecticides in agriculture, use of bioagents for pest management has not been adopted in a big way due to susceptibility of bioagents to abiotic and insecticide-induced stresses, though in a totally insecticide free environment, they have been reported to be suppressing the pest to the tune of 50-60%. Recognizing the potential of *Trichogramma* species as biological control agents, entomologists in the early 1900s began to mass rear *Trichogramma* for insect suppression. Today, *Trichogramma* species are the most widely used insect natural enemy in the world, partly because they are easy to mass rear and they attack many important crop insect pests. Nine species of *Trichogramma* are reared in private or government owned insectaries around the world and released annually on an estimated 80 million acres of agricultural crops and forests in 30 countries. *Trichogramma* are released to suppress 28 different lepidopteran pests attacking maize, rice, sugarcane, cotton, vegetables, fruit trees etc.

Benefits /Utility

High temperature tolerant strain of *T. chilonis* can be used in high temperature zones.

Scalability

The technology can be extended to any extent.

Business and commercial potential

- No toxicological data or registration is required for its commercial use.
- Since this strain is high temperature tolerant, these can be used in field alone with farmers practice and go well with IPM.
- These can be used in most of the crops like rice, maize and sugarcane.

Financial requirement

For coverage of 100 ha of cropped area, initially an investment of Rs. 18.0-20.0 lakh is required. The investment on rearing facility is one time only and all equipments and rearing boxes can be used for 10 years. The recurring cost for a year would be about Rs. 8.4 lakh/annum. A mass rearing unit consisting of rearing boxes, egg laying cages, refrigerator, table UV hood, vacuum unit, etc are required.

Market potential

- *Trichogramma* production is a profitable business and there is only less than 0.5-1% cropped area is covered by this bioagent.

Economic analysis

The temperature tolerant strain of *T. chilonis* is very effective in reducing the number of harmful pests and has great impact on growth of vegetables and commercial crop production and will generate employment.

Development of HTTS of *T. chilonis*

Field validation of HTTS against sugarcane stemborers

Field evaluation of HTTS of *T. chilonis* against rice stem borers

Target Market/Customer

- Farmers
- Contract farming companies
- Farmer's federations/Groups
- Biocontrol agents producing companies
- This technology already commercialized to one firm.

Social Impact of the Technology

- Trichogrammatids are safe biocontrol agents and are specific against insect pests
- Cost-benefit ratio will be improved
- It is green technology
- Unemployed youth can start small production units through NABARD support to benefit farmers