

Database on Host Insects, Parasitoids and Predators maintained at NBAIR

Host insect	Stage supplied	Systematic position	Utility
HOST INSECTS			
<i>Corcyra cephalonica</i> (Stainton)	Eggs	Lepidoptera: Pyrilidae	For production of bio-agents or for Research work
<i>Sitotroga cerealella</i> (Olivier)	Eggs	Lepidoptera: Gelechiidae	For production of bio-agents or for Research work
<i>Helicoverpa amigera</i> (Hubner)	Eggs, 1 st instar larvae & pupae	Lepidoptera: Noctuidae	For production of bio-agents or for Research work
<i>Spodoptera litura</i> (Fabricius)	Eggs, 1 st instar larvae & pupae	Lepidoptera: Noctuidae	For production of bio-agents or for Research work
<i>Plutella xylostella</i> (Linn.)	Pupae	Lepidoptera: Plutellidae	For production of bio-agents or for Research work
<i>Callosobruchus</i> spp.	Adults	Coleoptera: Bruchidae	For production of bio-agents or for Research work
Mealy bug <i>Maconellicoccus hirsutus</i> Green	Ovisacs/Crawlers	Hemiptera: Pseudococcidae	For production of bio-agents or for Research work
Mealy bug <i>Ferrisia virgata</i> (Cockerell)	Gravid females/Crawlers	Hemiptera: Pseudococcidae	For production of bio-agents or for Research work
Scale <i>Hemiberlesia</i> <i>lataniae</i> (Signoret)	Infested pumpkin	Hemiptera: Diaspididae	For production of bio-agents or for Research work

Biocontrol Agent	Stage supplied	Systematic position	Target pest	Recommended dosage	No. of releases recommended
PARASITOIDS					
<i>Trichogramma chilonis</i> Ishii (I) #	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Sugarcane borers <i>Chilo infuscatellus</i> , <i>Chilo sacchariphagus indicus</i> , <i>Chilo auricilius</i> , <i>Acigona steniellus</i> ; Cotton (Non Bt) bollworms <i>Helicoverpa armigera</i> , <i>Pectinophora gossypiella</i> & <i>Earias</i> spp.; Maize stem borer <i>Chilo partellus</i> , Diamond back moth <i>Plutella xylostella</i> ; Tomato fruit borer <i>Helicoverpa armigera</i>	50,000/ha on sugarcane and vegetables; 100,000/ha on maize and 1,50,000/ha on cotton	Sugarcane: 4 to 6 releases at 10 days intervals for early shoot borer; 8 to 10 releases for stalk, internode and Gurdaspur borers Cotton (Non Bt) & Vegetables: Six weekly releases Maize: Three releases at five days intervals
<i>Trichogramma japonicum</i> (I)	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Top shoot borer of sugarcane <i>Scirpophaga excerptalis</i> and Paddy stem borer <i>Scirpophaga incertulas</i>	Sugarcane & Paddy: 50,000/ha	Sugarcane: 4 to 6 releases at 10 days intervals on observing pest or from 60 th day Paddy: 6 releases on appearance of pest or from 30 th day after transplantation

<i>Trichogramma achaeae</i> (I)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Cotton (Non Bt) bollworms and Bhendi Borer	1,50,000/ha on cotton (Non Bt) 50,000/ha on vegetables	Six releases at weekly intervals
<i>Trichogramma pretiosum</i> (E)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Tomato fruit borer <i>Helicoverpa armigera</i>	50,000/ha	Six releases at weekly intervals on appearance of pest or from 45 th day from transplation
<i>Trichogramma embryophagum</i> (E)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Apple Codling moth <i>Cydia pomonella</i>	2000 adults per tree or 100,000/ha	Releases starting from the first moth catch, continue at weekly intervals till pest egg availability in the field
<i>Trichogramma dendrolimi</i> Matsumara (E)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Targeted against tissue borers on maize and sugarcane – For Research work	-	-
<i>Trichogramma brassicae</i> (E)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Diamondback moth <i>Plutella xylostella</i> and Cabbage butterfly <i>Pieris brassicae</i> on cabbage and cauliflower	100,000/ha	Six releases at weekly intervals
<i>Trichogramma evanescens</i> Westwood	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Targeted against tissue borers on maize and sugarcane - For Research work	-	-
<i>Trichogramma mwanzai</i> (E)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Targeted against <i>Helicoverpa armigera</i> - For Research work	-	-

<i>Trichogrammatoidea armigera</i> (E)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Targeted against <i>Helicoverpa armigera</i> - For Research work	-	-
<i>Trichogrammatoidea bactrae</i> (E)*	Parasitised egg cards	Hymenoptera: Trichogrammatidae	Diamond back moth <i>Plutella xylostella</i> on cabbage	2,50,000/ha	Five releases at weekly intervals
<i>Telenomus remus</i> Nixon (E)	Parasitised egg cards	Hymenoptera: Scelionidae	Tobacco caterpillar <i>Spodoptera litura</i>	1 lakh /ha	Three to four releases
<i>Goniozus nephantidis</i> (Muesebeck) (I)	Cocoons	Hymenoptera: Bethyridae	Coconut black-headed caterpillar <i>Opisina arenosella</i>	10 adults per palm	Four releases
<i>Chelonus blackburnii</i> Cameron (E)*	Adults	Hymenoptera: Braconidae	Potato tuber moth <i>Phthorimaea operculella</i>	50000 adults /ha in the field 2 adults per kg of potatoes in godowns	Two releases at weekly intervals Three to four releases (or as per need) at fortnightly intervals

* Only Nucleus culture will be supplied, either for research work or for further scaling up for commercialisation

Sugarcane, Cotton and Vegetable strains of *T. chilonis* maintained; I: Indigenous; E: Exotic

Biocontrol Agent	Stage supplied	Systematic position	Target pest	Recommended dosage	No. of releases recommended
<i>PREDATORS</i>					
<i>Cryptolaemus montrouzieri</i> Mulsant (E)	Adults / Grubs	Coleoptera: Coccinellidae	Mealy bugs <i>Maconellicoccus hirsutus</i> , <i>Planococcus citri</i> , <i>P. lilacinus</i>	10 beetles or 50 grubs /infested plant or tree or 5000 beetles/ha	One or more releases based on pest intensity
Scymnus coccivora (Ramakrishna Ayyar) (I)	Adults	Coleoptera: Coccinellidae	Mealy bugs on citrus, grapes and other fruit crops (<i>M. hirsutus</i> , <i>Planococcus</i> spp.)	600 – 2500 adults/ha	One or more releases based on pest intensity
<i>Chilocorus nigrita</i> (Fabricius) (I)	Adults / Eggs	Coleoptera: Coccinellidae	Sugarcane scale insect <i>Melanaspis glomerata</i> Citrus scale <i>Aonidiella aurantii</i>	1500 beetles/ha; or 10 egg pads (with 40 eggs per pad) in 100 spots/ha (40,000 eggs/ha)10 adults/tree	One or more releases based on pest intensity
<i>Cheilomenes sexmaculata</i> Fabricius (I)*	Adults / Eggs	Coleoptera: Coccinellidae	<i>Aphis craccivora</i> on legumes and <i>Lipaphis erysimi</i> on oilseed crops	5000 larvae or 500 adults per ha	Two releases; first release to coincide with the appearance of aphids
<i>Coccinella septempunctata</i> Linnaeus (I)*	Adults / Eggs	Coleoptera: Coccinellidae	<i>Aphis craccivora</i> on legumes and <i>Lipaphis erysimi</i> on oilseed crops	5000 larvae or 500 adults per ha	Two releases; first release to coincide with the appearance of aphids
<i>Brumoides suturalis</i> (Fabricius) (I)*	Adults	Coleoptera: Coccinellidae	Aphids and white flies	-	-
<i>Curinus coeruleus</i> Mulsant (E)	Adults	Coleoptera: Coccinellidae	Subabul psyllid <i>Hetropsylla cubana</i>	20 Adults per tree	Two releases during July and October
<i>Chrysoperla carnea</i> (Stephens) (I)	Eggs / First instar larvae	Neuroptera: Chrysopidae	Sucking pests on cotton, tobacco, sunflower, groundnut & some fruit crops	10,000 first instar larvae/ha	Twice during the season with an interval of 15 days On fruit crops, 10 – 20 larvae per infested tree

<i>Mallada</i> spp. (I) *	Cocoons	Coleoptera: Coccinellidae	Sucking pests on cotton, tobacco, sunflower, groundnut & some fruit crops	10,000 first instar larvae/ha	Twice during the season with an interval of 15 days On fruit crops, 10 – 20 larvae per infested tree
<i>Ischiodon scutellaris</i> (Fabricius) (I) *	Cocoons	Diptera: Syrphidae	<i>Aphis craccivora</i> on legumes and <i>Lipaphis erysimi</i> on oilseed crops	5000 larvae/ha	-
<i>Micromus timidus</i> (Hagen) (I) *	Larvae	Neuroptera: Hemerobiidae	<i>A. craccivora</i> on legumes & oilseeds & Sugarcane Woolly Aphid	Research in progress	Research in progress
<i>Cardiastethus exiguus</i> Poppius (I)	Adults/Nymphs	Hemiptera: Anthocoridae	<i>Opisina arenosella</i> Coconut black-headed caterpillar	50 nymphs/adults per tree	Three releases
<i>Blaptostethus pallescens</i> Poppius (I)	Adults/Nymphs	Hemiptera: Anthocoridae	Spider mites on bhendi	5 to 10 nymphs per plant	Five releases
<i>Xylocoris flavipes</i> (Reuter) (I) *	Adults/Nymphs	Hemiptera: Anthocoridae	Storage pests	For research work	-
<i>Orius tantillus</i> / <i>Orius maxidentex</i> . (I) *	Adults/Nymphs	Hemiptera: Anthocoridae	Thrips	For research work	-

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Exotic <i>Trichogramma</i> spp. from France with <i>Wolbachia</i> for Research purpose (Lab reared on <i>Sitotroga cerealella</i> at source)			
<i>Trichogramma cacaeciae</i> Marchal (E)*	Parasitised eggs	Hymenoptera: Trichogrammatidae	For research work
<i>Trichogramma cordubensis</i> Vargas and Cabello (E)*	Parasitised eggs	Hymenoptera: Trichogrammatidae	For research work
<i>Trichogramma embryophagum</i> (Hartig) (E)*	Parasitised eggs	Hymenoptera: Trichogrammatidae	For research work
<i>Trichogramma evanescens</i> Westwood (E)*	Parasitised eggs	Hymenoptera: Trichogrammatidae	For research work
<i>Trichogramma pretiosum</i> Riley (E)*	Parasitised eggs	Hymenoptera: Trichogrammatidae	For research work
<i>Trichogramma semblidis</i> (Aurivillius)(E)*	Parasitised eggs	Hymenoptera: Trichogrammatidae	For research work
<i>Trichogramma brasiliense</i> (Ashmead) (E)*	Parasitised eggs	Hymenoptera: Trichogrammatidae	For research work

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E: Exotic

<i>Trichogramma</i> spp. & <i>Uscana</i> spp. maintained in the Bio-systematics Laboratory – All indigenous		
Species	Locality of collection	Host insect / plant on which collected
<i>Trichogramma achaeae</i> Nagaraja & Nagarkatti	Tumkur and Saligrama strains	-
<i>Trichogramma danausicida</i> Nagaraja	Local, Aligarh, and Hessaraghatta strains	Ex. <i>Catopsilia pyranthe</i> on <i>Cassia fistula</i>
<i>Trichogramma semblidis</i> (Aurivillius)	Nr. Hessaraghatta	Ex. Tabanid eggs on paddy leaves
<i>Trichogramma</i> sp. nr. <i>cuttackensis</i> Nagaraja	Someshwar, Udupi dt.	Ex. Sciomyzid eggs on paddy leaves
<i>Trichogramma</i> sp. n. (being described)	Balehonnur	Ex. Unidentified pierid eggs (? <i>Catopsilia pyranthe</i>)
<i>Trichogramma flandersi</i> Nagaraja & Nagarkatti	Mandya	Ex. Eggs of <i>Chilo infuscatellus</i> on young sugarcane
<i>Trichogramma chilotraeae</i> Nagaraja & Nagarkatti	Bijwara	Ex. Eggs of <i>Lampides boeticus</i> on <i>Cajanus cajan</i>
<i>Trichogrammatoidea bactrae</i> Nagaraja	Hessaraghatta	Ex. eggs of <i>L. boeticus</i> on <i>Crotolaria mucronata</i>
<i>Trichogrammatoidea nana</i> (Zehntner)	Hessaraghatta	Ex. Unidentified lepidopterous eggs on <i>Cassia auriculata</i>
<i>Trichogrammatoidea fulva</i> Nagaraja	Chikkaballapur	Ex. Eggs of <i>Cryptophlebia ombrodelta</i> on tamarind pods
<i>Trichogrammatoidea</i> sp. nr. <i>Fulva</i>		Ex. Unidentified lepidopterous eggs on <i>Cassia auriculata</i>

<i>Trichogrammatoidea armigera</i> Manjunath	Hessaraghatta	Ex. Eggs of <i>Lampides boeticus</i> on <i>C. mucronata</i>
<i>Trichogrammatoidea</i> sp. nr. <i>armigera</i>	Hessaraghatta	Ex. Eggs of <i>L. boeticus</i> on <i>C. mucronata</i>
<i>Trichogrammatoidea robusta</i> Nagaraja	Hessaraghatta	Ex. Eggs of <i>L. boeticus</i> on <i>C. mucronata</i>
<i>Trichogrammatoidea</i> sp. nr. <i>robusta</i>	Hessaraghatta	Ex. Eggs of unidentified lepidopteran on pods of <i>C. auriculata</i>
<i>Uscana femoralis</i> Pajni	Hessaraghatta	Ex. Bruchid eggs on dry pods of <i>C. auriculata</i>
<i>Uscana</i> sp. no. 1	Hessaraghatta	Ex. Bruchid eggs on pods of <i>C. auriculata</i>
<i>Uscana</i> sp. no. 2	Bijwara	Ex. Bruchid eggs on tamarind pod