



# NBAII Newsletter



National Bureau of Agriculturally Important Insects  
Bangalore, India

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## *Into the next quinquennium...*



The last quinquennium saw the metamorphosis of the Project Directorate of Biological Control (PDBC) into the National Bureau of Agriculturally Important Insects (NBAII), with a well-defined mandate on insects and other arthropods that directly or indirectly influence Indian agriculture.

The next five-year period (2012-17) commenced on a positive note for the Bureau with the formation of three divisions: Insect Systematics, Molecular Entomology and Insect Ecology.

During this quarter, the Research Advisory Committee (RAC), chaired by one of the most eminent entomologists of our country, Dr B. Senapati, reviewed the progress of last year's research work at NBAII (5-6 May 2012). The Committee, comprising the other esteemed members, Dr B.V. David, Dr S.K. Gupta, Dr H.K. Bajaj and Dr R. Ramani, not only expressed their contentment on the progress of

research but also rightfully advised the scientists on the future course of action. Dr T.P. Rajendran, Assistant Director-General (Plant Protection), ICAR, provided a glimpse of the various plant protection initiatives that would find a place in the XII Plan. The presence Dr G.K. Veeresh, Chairman of the Quinquennial Review Team (QRT), all through the meeting turned out to be very valuable.

Since seeing is believing, a trip to our research farm at Attur, provided the crucial first-hand information on the ongoing field trials to the RAC. The team was also pleased with the new laboratory facility that is about to be inaugurated shortly.

During 26-28 June, the QRT reviewed the progress of research work at south Indian centres under the All-India Coordinated Research Project (AICRP) on Biological Control of Crop Pests and Weeds as well as the All-India Network Projects (AINPs) on Agricultural Ornithology, Whitegrubs and Agricultural Acarology.

**N.K. Krishna Kumar**  
Director



New laboratory facility



Open-top carbon dioxide chambers



Vegetable block



Mango block

Members of the RAC at the Research Farm

## Incidence of Thai sacbrood virus disease in south India

NBAII took swift action to resolve the sudden outbreak of a disease in the Indian honeybee, *Apis cerana*, in Karnataka and Kerala.

Dr A.N. Shylesha and Dr R. Rangeshwaran visited the areas of Karnataka bordering Kerala and diagnosed the infection as the Thai sacbrood virus (TSBV) disease based on the symptoms observed in Puttur, Sulya and Kasaragod. Samples collected during the first half of April 2012 from northern and southern Kerala and bordering Tamil Nadu by a team consisting of Dr Rangeshwaran; Dr Rajan, Project Coordinator (Honeybees & Pollinators); and Dr S. Devanesan of Kerala Agricultural University, confirmed the virus epidemic. Some samples showed secondary bacterial infections, too.

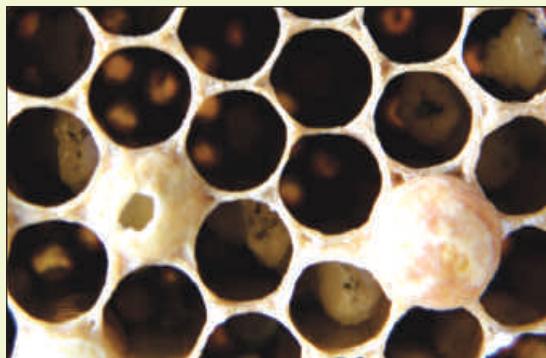
**Symptoms:** General symptoms of viral infection are seen in the early larval stage and death occurs in the late larval or pre-pupal stages. The infected sealed brood cells are irregularly scattered on the combs with perforations on the cap. The dead larvae usually lie at the bottom of the cell with head typically turned up. The larva, if picked up with a needle, shows sac-like water-filled body. In a severely



Sac-like water-filled body of the larva

infected colony, the adults become sluggish and do not go out for foraging while the queen gradually stops laying eggs. The presence of sac-like diseased larvae scattered on the bottom board is an indication of TSBV.

**Suggested preventive measures:** TSBV gets transmitted from one colony to other by contact with bees from infected colonies during foraging and robbing. In view of rubber honey flow season, colonies from Kerala and Tamil Nadu are migrated to Sulya and Puttur in Karnataka, where vast rubber plantations are present. Because of the spread of the disease, such movements of bee hives have to be restricted or banned immediately. It has been observed by the survey team that the migrated colonies are kept in unhygienic condition in arecanut and rubber orchards without proper stand or spacing of the colonies leading to fast spread of this disease. It is advised that local beekeeping associations/ societies should initiate proper awareness among the beekeepers to contain this serious disease of honeybees.



Blackening of the larval head and dead larvae at the base

## New Research

### Sacbrood virus genome

Complete coding sequence (CDS) of the ssRNA genome of Thai sacbrood virus (TSBV) infecting *Apis cerana* was determined for the first time in India. Seven samples from Kerala, Tamil Nadu and Karnataka were analysed by RT-PCR using sacbrood specific primers and complete CDS was obtained by primer walking. Blast analysis indicated that all the samples showed presence of the virus. The open reading frame of the polyprotein was also determined. The sequences were submitted to NCBI through Sequin Application Version 12.10 (Table I). Secondary bacterial infection was also noticed and association of *Bacillus cereus*, *Proteus mirabilis*, *P. penneri* and *Pseudomonas aeruginosa* was identified in the samples.

Table I: Complete coding sequences of TSBV

Coordinates	State	CDS length (bp)	NCBI Acc. No.
N 08°19.843' E 077°17.854'	Tamil Nadu	8740	JX194121
N 08°56.787' E 076°50.201'	Kerala	8680	JX270795
N 08°35.494' E 077°04.004'	Kerala	8743	JX270796
N 12°34.223' E 075°26.359'	Karnataka	8700	JX270797
N 12°35.585' E 075°50.359'	Karnataka	8756	JX270798
N 12°37.079' E 075°26.359'	Karnataka	8741	JX270799
N 12°37.079' E 075°26.359'	Karnataka	8740	JX270800

## First reports

A new species of Dolichogenidea (Hymenoptera: Braconidae) (Fig. 1) was found parasitising the larvae of *Thoressa evershedi* (Lepidoptera:Hesperiidae) in the Western Ghats, Kerala.

*Xanthopimpla elegans* (Fig. 2), a larval parasitoid of *Sylepte derrogate*, was collected for the first time from Middle Andamans.



Fig. 1: *Dolichogenidea* sp.



Fig. 2: *Xanthopimpla elegans*

## Web content on agriculturally important insects of India

A website on common insects in Indian agroecosystems, with emphasis on pests of crops, has been constructed and hosted on NBAII's website (URL: <http://www.nbaii.res.in/Pestsofcrops/Indian%20Insects.htm>). This site provides basic taxonomic and biological information on over 325 species with high-resolution colour photographs and is regularly updated. The site has been indexed by ID Source, a compilation of websites worldwide that provide identification aids for pests, diseases and weeds.

## NBAII trains Bhutanese scientists



The Royal Government of Bhutan sent a batch of four scientists to undergo training on "Biological Suppression of Crop Pests and Quality Assurance" at Bangalore during 1–16 May 2012. The programme, jointly organised by the Indian Institute of Horticultural Research (IIHR, Bangalore) and NBAII, comprised classroom lectures as well as field visits. The practical and application-oriented first part of the programme at IIHR gave the trainees a head start on biocontrol of insect pests, plant diseases and plant parasitic nematodes in vegetable, fruit and ornamental crops. Later, at NBAII, the visiting scientists were exposed to the mass production techniques for parasitoids, predators, pathogens, entomopathogenic nematodes and antagonists. Dr B.S. Bhumannavar coordinated the programme at our Bureau.

## Roadmap for entomopathogenic nematodes

The Society for Biocontrol Advancement (SBA) and NBAII jointly organised a one-day "Brainstorming Session on Roadmap for Entomopathogenic Nematode Research and Application/Utilisation in IPM" on 20 April 2012 at NBAII. The purpose of the meet was to understand, evaluate and reorient the current research on entomopathogenic nematodes (EPN) in India by identifying priority areas based on the needs of stakeholders, consolidating a working group and coordinating the research outcome for effective utilisation. The 60 participating scientists from across India

explored the following issues: (i) Biodiversity of EPN and bacteria-feeding nematode fauna; (ii) Molecular identification; (iii) Genomics of EPN and functional proteomics; (iv) National repository for EPN germplasm; and (v) Production, formulation and application technologies of EPN in IPM. Dr M. Nagesh organised the meet, which was the brainchild of Dr N.K. Krishna Kumar, Director, NBAII. Dr T.P. Rajendran, ADG (PP), ICAR, participated and set the tone for the proceedings of the day.



## XXI Biocontrol Workers' Group Meeting



Inaugural session

The "XXI Biocontrol Workers' Group Meeting" of the AICRP on Biological Control of Crop Pests and Weeds was conducted at the Acharya N.G. Ranga Agricultural University (ANGRAU), Hyderabad, during 22–23 May 2012 to review the progress of work done by different AICRP centres during 2011–12 and to suggest the future line of work in accordance with the XII Plan mandate. Dr T.P. Rajendran, ADG (PP), ICAR; Dr N.K. Krishna Kumar, Director, NBAll; Dr R. Sudhakara Rao, Director of Research, ANGRAU; Dr M. Mallikarjuna Reddy, Associate Director of Research, ANGRAU; and several dignitaries

from ANGRAU, ICAR Institutes and the Department of Agriculture, Government of Andhra Pradesh and the private industry attended the workshop apart from the scientists of AICRP and NBAll. During the plenary session, Dr V. Nagireddy, IAS, Vice-Chancellor, ANGRAU, addressed the biocontrol workers. The progress of research on biological control of insect pests, plant diseases and nematodes of various crops using parasitoids, predators, pathogens and antagonists was thoroughly discussed and the recommendations as well as midterm corrections of the technical programme for 2012–13 were finalised.



Plenary session

## New Scientists at NBAll



**Dr Mahesh Yandigeri**, Senior Scientist (Microbiology), switched bases from the National Bureau of Agriculturally Important Microorganisms (NBAIM, Maunath Bhanjan) to NBAll on 4 June 2012. He is a gold-medallist from the Indian Agricultural Research Institute (IARI, New Delhi). While at NBAIM, Dr. Yandigeri analysed the diversity of actinomycetes from various ecological niches like mangroves, Indo-Gangetic Plain, extreme climates, salt- and drought-stressed regions, etc. He characterised many microorganisms through sequencing their rRNA genes besides the metabolic and housekeeping genes. He has published 15 research papers in acclaimed journals and has deposited over 110 sequences with the GenBank.



**Dr M. Mohan**, Senior Scientist (Agricultural Entomology), joined NBAll on 1 June 2012, after a four-year stint at the Directorate of Rice Research (DRR, Hyderabad). He comes with an excellent experience on Bt, from isolation to its application, as well as on insect resistance to insecticides. His doctoral work on the mechanism of insect resistance to Bt, at IARI, earned him the prestigious Jawaharlal Nehru Award and a gold medal in 2002. Dr Mohan did his post-doctoral research at the Indian Institute of Science (IISc, Bangalore) with a grant from the Department of Biotechnology (DBT), Government of India, during 2001–03. He has published more than 30 research papers and has filed a patent on a Bt preparation.

## Awards & Recognition

**Dr Chandish R. Ballal**, Principal Scientist (Agricultural Entomology), NBAll, received the *Dr S. Sithanantham Biocontrol Award* for 2010–11 during the "National Symposium on Plant Protection in Horticultural Crops: Emerging Challenges and Sustainable Pest Management" held at the Indian Institute of Horticultural Research, Bangalore (25–28 April 2012).

**Dr N.K. Krishna Kumar**, Director, NBAll; **Dr Ballal**; and **Dr T. Venkatesan**, Senior Scientist (Agricultural Entomology), NBAll, were admitted as Fellows of Association for Advancement of Pest Management in Horticultural Ecosystems during the above symposium.

## Selected Publications

Ballal, C.R., Gupta, T. & Joshi, S. 2012. Predatory potential of two indigenous anthocorid predators on *Phenacoccus solenopsis* Tinsley and *Paracoccus marginatus* Williams and Granara de Willink. *Journal of Biological Control*, 26(1): 18–22.

Gupta, T., Ballal, C.R. & Joshi, S. 2011. Preferential feeding of an anthocorid predator *Blaetostethus pallescens* on different stages of cotton mealybug. *Journal of Environmental Entomology*, 33(4): 423–428.

Ramaraju, K. & Poorani, J. 2012. A new species of *Coccipolipus* (Acari: Podapolipidae) parasitic on the giant coccinellid beetle from India. *International Journal of Acarology*, 38(4): 290–296.

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