# NBAII Newsletter

National Bureau of Agriculturally Important Insects
Bangalore, India

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## NBAII is a Centre of Excellence

Within a few years of its establishment, NBAII has emerged as a centre of excellence in the areas of insect genomics, molecular systematics, entomo-pathogenic nematodes, management of invasive alien pests, mass production of biocontrol agents and quality assurance. Recognising the national insect reference collection being maintained at NBAII, the Ministry of Environment and Forests, Government of India, has designated the NBAII as a repository under the Biological Diversity Act of 2002 for agriculturally important insects, mites and spiders. Under the sub-section (2) of Section 39 of the Act, this designated repository shall also keep in safe custody the representative samples, as voucher specimens, along with type specimens and DNA fingerprints.

One of our research projects entitled "Effect of abiotic stresses on the natural enemies of crop pests: *Trichogramma*, *Chrysoperla*, *Trichoderma* and *Pseudomonas* and mechanism of tolerance to these stresses", funded by the National Agricultural Innovation Project (NAIP), has been extended up to March 2014 to facilitate the commercialisation and patenting of two biocontrol products. We are proud of this achievement since only 14 out of the 100 NAIP research projects got the nod for extension.

We conducted the Institute Research Council Meeting on 3 September, specially to consider new project proposals from recently joined scientists. On 19 July, the Quinquennial Review Team evaluated the research output from NBAII for the period 2007-12.

Another important event took place during this quarter. Our former Director, Dr N.K. Krishna Kumar, was elevated as the Deputy Director-General (Horticulture). He took charge on 9 August at New Delhi and returned to a rousing welcome at NBAII the next day. I consider his selection as a great honour to the plant protection fraternity of India, particularly entomologists, as an eminent entomologist has now occupied this coveted post for the first time in the history of ICAR.

***B.S. Bhumannavar***
Director (Acting)

## Congratulations to Dr Krishna Kumar!

The Staff Welfare Association of NBAII organised a grand farewell party on 10 August 2012 to honour and congratulate the outgoing Director of NBAII, Dr N.K. Krishna Kumar, on his taking over charge as the new Deputy Director-General (Horticulture) of ICAR. The good news, though, is that Dr Krishna Kumar will not be severing his ties with NBAII as he would continue to guide the institute and share his wisdom whenever sought. All the staff members of NBAII wish Dr Krishna Kumar the best, both professionally and personally, as he moves into his new position.

## Profile of Dr B.S. Bhumannavar

Dr B.S. Bhumannavar was born at Khalaghatgi, a small village in Dharwad district of Karnataka, on 18 May 1951. After graduated in 1974 from the College of Agriculture, Dharwad, he went on to complete his M.Sc. (Ag.) degree in agricultural entomology from the same college in 1976 securing a gold medal. He obtained a doctorate from the College of Agriculture, University of Agricultural Sciences, Bangalore, in 2000, again with a gold medal.

Dr Bhumannavar joined the Agricultural Research Service of ICAR in September 1977 and was first posted at the Central Horticultural Experiment Station (CHES, Chettalli). There he researched citrus entomology for 10 years, mainly screening citrus germplasm for the incidence of leaf-miner, psyllid, black citrus aphid, oriental red mite, green and purple scale. He worked out the biology of the citrus shoot borer, *Oberea lateapicalis*, for the first time. While at Chettalli, he also maintained more than 60 bee colonies, conducted pollination studies in coffee and niger, and measured the quantum of extra-floral nectar in Schefflera.

Subsequently, he opted to serve at the Central Agricultural Research Institute (CARI, Port Blair) in the Andaman and Nicobar Islands. He spent the four years of his stay studying the diversity of insects attacking different crops grown on these bay islands. After getting all the collected insects and natural enemies identified at the British Museum, he published a multi-coloured bulletin with the title 'Insects of agricultural Importance in Bay Islands', which serves as a guide for new entomologists.

Dr Bhumannavar's full-time foray into biological control research began in November 1991 with his joining the Project Directorate of Biological Control (PDBC; now NBAII). Initially his focus was on the mass multiplication of the egg parasitoids, *Trichogramma* species, as well as the standardisation of mass multiplication of their laboratory host, *Corcyra cephalonica*. Over time, as the chief of the insect systematics laboratory, he was responsible for the importation of exotic natural enemies such as *Diglyphus begini*, *Trichogramma mwanzai*, *T. brassicae*, parasitoids of papaya mealybug and the Chromolaena gall fly, *Cecidochares connexa*, from across the world.

Dr Bhumannavar earned another feather in his cap by resolving the controversy surrounding the Mexican beetle, *Zygogramma bicolorata*, a biocontrol agent for parthenium weed, by conclusively proving that it can not be a pest of sunflower.

He adeptly handled the Prioritising, Monitoring and Evaluation Cell of the institute from July 2007 till his taking over charge as Director (Acting) of NBAII on 10 August 2012.

## New Research

### Parasitic wasps attacking hesperiids

*Cotesia erionotae* (Fig. 1) is reported for the first time from India (Ankita Gupta & Kalesh, 2012). It was found parasitising larvae of *Udaspes folus* (Lepidoptera: Hesperiidae) from the Western Ghats, Kerala and Karnataka.

During a recent survey in the Andaman and Nicobar Islands, the ichneumonid wasp, *Leptobatopsis indica* (Ichneumonidae: Banchinae) (Fig. 2), was found parasitising *Parnara guttatus* (Lepidoptera: Hesperiidae).

**Fig. 1: *Cotesia erionotae***

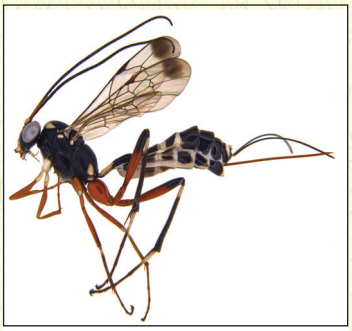


**Fig. 2: *Leptobatopsis indica***

### Culturable bacteria from cotton leafhoppers

Culturable bacteria were isolated from six populations of the leafhopper, *Amrasca biguttula biguttula*, collected from cotton crop in Ludhiana, Punjab. 16S rDNA analysis revealed their identities as *Serratia marcescens* (GenBank Accession No. JX893010), *Serratia* sp. (JX893011), *Lysinibacillus sphaericus* (JX893012) and *Proteus mirabilis* (JX893013, JX893014 & JX893015).

### Observations on *Apis florea*

A dwarf-honeybee (*Apis florea*) colony (Fig. 3) was observed on a custard apple tree at the NBAII Research Farm. It is an important pollinator of many crop plants like niger, sunflower and onion. The species is supported by a variety of wild flora such as *Spermacoce hispida* and *Muntingea calabura*.

**Fig. 3: *Apis florea* colony**

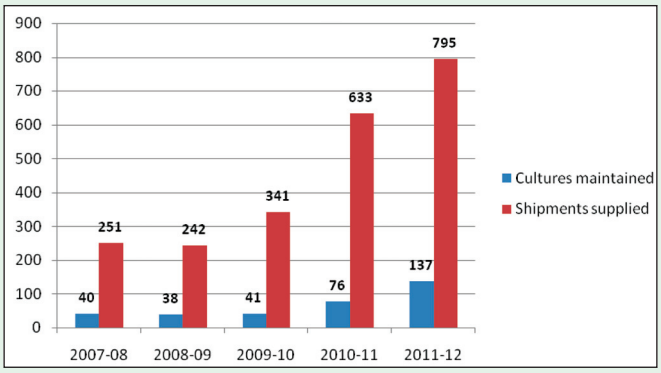
## Repository of live insects at NBAII

The mission of NBAII is to act as a nodal agency for the collection, characterisation, documentation, conservation, exchange and utilisation of agriculturally important insect resources (including mites and spiders) for sustainable agriculture. For utilisation of insect resources, it is important to continuously maintain quality live insect cultures. Live insect cultures are required for research on various aspects, such as host plant resistance, insecticide resistance management, testing of *Bt* transgenic crops, evaluation of insects as biocontrol agents for management of crop pests, etc.

NBAII holds the country's largest repository of live insects. This repository consists of three categories of insect cultures: (i) host insects which are used for multiplying biocontrol agents or for research; (ii) species/strains of parasitoids for research or for field releases against target pests; and (iii) species/strains of predators for research or for field releases against target pests. As on date, 99 live insect cultures, comprising 19 hosts, 59 parasitoids and 21 predators, are being maintained continuously in the repository.

Besides, 38 more insect cultures are being maintained specifically for certain research activities for fixed project periods. The list of live insect cultures keeps expanding based on new pest problems and research thrusts. The NBAII website (http://www.nbaii.res.in) provides a database (http://www.nbaii.res.in/databases.html) on the insect cultures available with information on the scientific name, systematic position and utility of the insect as well as the stage of the insect that can be supplied by NBAII. A brochure with pictures and cost of some of the potential bioagents is available at http://www.nbaii.res.in/culturesavailable.pdf.

Today, rapid urbanisation, reinforced by a high rate of population growth and sprawl of cities into farming areas, has resulted in almost complete destruction of the natural flora and fauna. This has also led to non-availability of several insect species either from the natural or cultivated crops. At this juncture, NBAII is providing a yeomen service to researchers, students, commercial units and farmers by providing quality live insect cultures. The following figure, which provides the information on the number of cultures maintained at and shipments sent from NBAII during the last five years, gives a clear indication of the increasing demand for live insect cultures.




**The number of live insect cultures maintained at NBAII and the number of shipments supplied during the last five years**

**Mass rearing of *Corcyra cephalonica*, a host for producing Tricho cards**

**Mechanical collection of *Corcyra cephalonica* moths**

**Mass rearing of mealybugs and coccinellid predators**

## Designation of NBAII as a repository under the Biological Diversity Act

The Ministry of Environment and Forests, Government of India, has designated NBAII as a repository for agriculturally important insects, mites and spiders under the Biological Diversity Act of 2002 (Order No. F. No. 26-15/2007-CSC dated 12 September 2012). In accordance with sub-section (2) of Section 39 of the Act, NBAII shall also keep in safe custody the representative samples as voucher specimens of the biological materials accessed in accordance with the provisions of Section 19 of the Act. Other relevant information related to the material, such as DNA fingerprints, shall also be available with NBAII if the same is required by the National Biodiversity Authority (NBA). In addition, NBAII shall also keep in safe custody the type specimen deposited by any person who discovers a new taxon, in accordance with sub-section (3) of Section 39 of the Act.

## Refresher training course conducted

Fifteen researchers from the All India Coordinated Research Project on Plant Parasitic Nematodes with Integrated Approach for their Control participated in a refresher training course on "Production, Commercialisation and Utilisation of Beneficial Organisms for the Management of Plant Parasitic Nematodes" at NBAII during 27-31 July 2012. A technical laboratory manual on antagonistic/ beneficial microbes, scale-up production, post-harvest processing, formulations, biosafety, registration regulations, field use, etc. was provided as a ready reference to the trainees. A visit to the Bio-Control Research Laboratories (BCRL, Bangalore) and trips to commercial polyhouses were organised for the benefit of the trainees. Dr M. Nagesh and Dr Jagadeesh Patil coordinated the programme.

## New Faces at NBAII

**Dr Jagadeesh Patil**, Scientist (Nematology), joined NBAII on 2 July 2012 after spending the first two years of his career at the Central Plantation Crops Research Institute (CPCRI, Kasaragod). Dr Patil, a Ph.D. from the Indian Agricultural Research Institute (IARI, New Delhi), did a part of his Ph.D. research work at Rothamsted Research, United Kingdom, under the UK-India Education and Research Initiative (UKERI) funded by the British Council. In 2011, he won the Professor D.J. Raski Academic Merit Award from the Nematological Society of India. He has five publications to his credit.

**Mr M. Eswar Reddy** and **Ms Dipanwita Deb** are the two new assistants in the administrative section of NBAII. Both joined NBAII in September 2012 after successfully clearing an all-India examination conducted by the Agricultural Scientists' Recruitment Board (ASRB, New Delhi). Mr Reddy, who hails from Kadapa district of Andhra Pradesh, is a B.Tech. in computer science from the Annamacharya Institute of Technology and Sciences located in Rajampet in his native district. Ms Deb, a Bengali from Kolkata, holds a B.Sc. (Honours) degree in physics. She has earlier worked with a software major and also has secretarial experience in the government sector.

## Selected Publications


Ankita Gupta & Kalesh S. 2012. Reared parasitic wasps attacking hesperiids from Western Ghats (Kerala, India) with description of a new species of *Dolichogenidea* (Hymenoptera: Braconidae) as a larval parasitoid of *Thoressa evershedi* (Evans) (Lepidoptera: Hesperiidae). *Zootaxa*, 3413: 29–43.

Ballal, C.R., Gupta, T. & Joshi, S. 2012. Production protocols for and storage efficacy of an anthocorid predator *Cardiastethus exiguus* Poppius. *Journal of Environmental Entomology*, 34: 50–56.

Ballal, C.R., Gupta, T. & Joshi, S. 2012. Effect of different laboratory hosts on the fertility table parameters and continuous rearing of an anthocorid predator *Orius tantillus* (Motsch.). *Pest Management in Horticultural Ecosystems*, 18: 24–28.

Ballal, C.R., Gupta, T. & Joshi, S. 2012. Morphometry and biology of a new anthocorid *Montandoniola indica*, a potential predator of *Gynaikothrips uzeli*. *Integrated Control in Protected Crops, Mediterranean Climate, IOBC WPRS Bulletin*, 80: 79–84.

Nagaraja, H. & Mohanraj, P. 2012. Two species of *Trichogrammatoidea* (Hymenoptera: Trichogrammatidae) from Bangalore, India. *Journal of Biological Control*, 26: 217–221.

Shylesha, A.N. & Joshi, S. 2012. Occurrence of Madeira mealybug, *Phenacoccus madeirensis* Green (Hemiptera: Pseudococcidae) on cotton in India and record of associated parasitoids. *Journal of Biological Control*, 26: 272–273.



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