

NBAIR Newsletter

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ICAR–National Bureau of Agricultural Insect Resources



Moving from 2019, the International Year of Indigenous Languages, to 2020, the International Year of Plant Health

The year 2019 was marked as the International Year of Indigenous Languages by the United Nations (UN) with an aim to raise awareness of the consequences of the endangerment of indigenous languages across the world, and to establish a link between language, development, peace and reconciliation. There is a clear realisation that more than half of the world's 7,000 languages are endangered. The death of each language would undoubtedly lead to a significant erosion of centuries-old human knowledge about local plant and animal life as information about local ecosystems is so intricately woven into these languages. Indigenous knowledge held by local people can provide a huge range of valuable information about floral and faunal species. Taxonomists and applied entomologists can access this information through interactions with local farmers. NBAIR, located in Bengaluru, Karnataka, paid its respects to “Karu-Nadu” and to Kannada language by celebrating “Kannada Rajyotsava”, the foundation day of this sandalwood state, in a befitting manner. Training programmes were conducted for local farmers on-site and at NBAIR as we realise that the farmers hold the right to be aware of novel technologies developed in research institutions. NBAIR has also taken up the task of preparing and distributing technical/field manuals in Kannada.

During 2019, we accepted the huge challenge to find sustainable solutions to two invasive pests — the fall armyworm and the rugose spiralling whitefly. Promising indigenous macrobials and microbials to manage these pests were identified, farmer participatory field trials were conducted and manuals on biocontrol-based management strategies were prepared in local languages, which were accepted and disseminated by farmers in different states. Through the AICRP-Biocontrol network centres, several folders and manuals have been prepared in different local languages, thus ensuring that there is assimilation at regional level and spread of information in the true sense.

The UN has dedicated 2020 as the International Year of Plant Health (IYPH) to create awareness on plant health

and the impact of healthy plants and forests on food security, poverty, economic development and sustainability. The focus for IYPH is to raise global awareness on protecting plant health and protecting the environment. It is documented that annually up to 40 per cent of global food crops are lost to pests and diseases leading to annual agricultural trade losses of over \$220 billion, which drastically affects poor rural communities. We cannot blame climate change for all our pest- and disease-related problems. Human activities are largely responsible for altering ecosystems, reducing biodiversity and creating conditions where pests can thrive.

At this juncture, we realise and accept that NBAIR has a major role to play during IYPH 2020. Our focus will continue to be on protecting plants, people and the planet. We have to be on constant vigil to prevent the introduction of alien pests through constant monitoring in vulnerable areas, and prevent the spread of these pests through not only development of management strategies, but also sharing the best and sustainable practices amongst all stakeholders. We are confident of achieving these with the expertise we hold in the areas of taxonomy, biological control and insect behaviour. One of the recent invasives that NBAIR has identified is the polyphagous woolly whitefly, *Aleurothrixus floccosus*, on guava. Besides identifying, documenting, developing non-chemical management strategies and creating awareness on such invasives, in order to achieve the objectives of IYPH, our thrust should be on developing strategic partnerships with all stakeholders — including government, academia, research institutions, civil society, private sector, farmers and global organisations — as we believe in working together to succeed together.

NBAIR family wishes all a very happy, peaceful and productive 2020!

Chandish R. Ballal
Director



Research Highlights

Systematic studies on a trans-regional level

Nine species (200+ specimens) of the genus *Cotesia* were identified. Three new species, viz. *Cotesia elongata*, *C. khuzestanensis* and *C. zagrosensis*, and two known species, *C. cynthiae* and *C. glabrata*, were recorded for the first time from Iran. *Deuterixys tenuiconvergens* Zargar & Gupta from Khuzestan province, the second species to be described under the genus *Deuterixys* from Iran, was described and illustrated.

New report of a parasitoid on fall armyworm

Field surveys conducted during 2018-19 in maize fields infested with the fall armyworm, *Spodoptera frugiperda*, in Karnataka, Tamil Nadu, Rajasthan and Meghalaya revealed that *Cotesia ruficrus* (Fig. 1) was a common gregarious larval parasitoid of *S. frugiperda*. This association was earlier reported only from Trinidad and Tobago.



Fig. 1: *Cotesia ruficrus*

First report of *Eusthenes robustus* from Meghalaya

Eusthenes robustus (Fig. 2), a tessaratomid bug, was recorded for the first time in Meghalaya. This olivaceous green species, with a large and stout body, measured 30–35 mm in length.

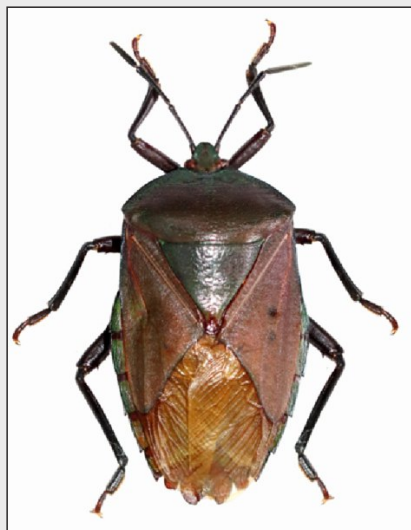


Fig. 2: *Eusthenes robustus*

Discovery of male of *Aduncothrips asiaticus*

Male of the thrips species *Aduncothrips asiaticus* (Fig. 3) was discovered for the first time in Vijayapura, Karnataka, on an agriculturally important new host plant, *Moringa oleifera*.



Fig. 3: *Aduncothrips asiaticus*

New record of genus *Opimothrips* from India

The thrips genus *Opimothrips* was recorded for the first time from India with the report of *O. tubulatus* (Fig. 4). It was collected on an unidentified plant in Chitradurga, Karnataka.



Fig. 4: *Opimothrips tubulatus*

Mass rearing of *Chelonus* spp. for use against fall armyworm

Chelonus spp., the egg-larval parasitoids of *Spodoptera frugiperda*, were collected from all over Karnataka. Both small and large arrehenotokous parasitoids were frequently found. Species-level identification of these parasitoids is under progress. Adults of *Chelonus* spp. were exposed to eggs of their natural hosts, i.e. *S. frugiperda* and *S. litura*, and the laboratory host *Coryra cephalonica* at 25 ± 2 °C and 65 ± 2 % RH for 48 h. Hatched neonates were reared on artificial diet. Developmental period was found to be 20–25 days on natural hosts and 25–50 days on *C. cephalonica*. Adult longevity varied from 2 to 7 days. On natural hosts, egg parasitism was 10–19.4% with 45–57.5% adult emergence. In contrast, 85–98% adult emergence was recorded on eggs of *C. cephalonica*. Successful rearing on *Coryra* eggs for many generations enabled mass rearing and release of *Chelonus* sp. as one of the IPM components for the management of fall armyworm on maize during monsoon and post-monsoon seasons across Karnataka.

NBAIR celebrates its 26th Foundation Day

NBAIR celebrated its 26th “Foundation Day” at the Karnataka Veterinary Council Auditorium on 19 October 2019. The chief guest, Dr Ashok Dalwai, IAS, CEO, National Rainfed Area Authority, Ministry of Agriculture and Farmers' Welfare, Government of India, lauded the functioning of the bureau and attributed it to the cohesive nature of its staff in executing the assigned tasks. In his address, he emphasised that research should be centred around the problems that plague farmers' income. Dr Chandish R. Ballal, Director of NBAIR, briefed the audience on the achievements of the organisation during 2019-20. She outlined the growth of the bureau starting from the early PDBC during the 1990s to NBAII and NBAIR. She highlighted the different technologies commercialised by the bureau and the list of patents granted. Outstanding workers in scientific, technical, administrative and supporting staff categories were awarded on the occasion. Also, *Dr R.J. Rabindra Team Award* was conferred on the best research team. The post-lunch cultural programme comprised classical dances, songs, skits and mime by the staff and their families. (Please see page 8 for the list of awardees)



NBAIR celebrates Kannada Rajyotsava

NBAIR celebrated “Kannada Rajyotsava” on 19 December 2019. Dr N. Narasimha, retired Professor and Head, Department of Agricultural Extension, University of Agricultural Sciences, Bengaluru, graced the occasion as the chief guest. In his speech, Dr Narasimha emphasised how communication skills matter for an agricultural scientist to effectively transfer technologies to farmers. Director Dr Chandish R. Ballal, in her address, congratulated the staff of NBAIR for their involvement in the programme. Reiterating the importance of the state language, she urged everyone to learn Kannada for developing rapport with local farmers. Earlier in the day, the chief guest planted a sapling of *Ficus racemosa* to commemorate the occasion. *Best Worker Awards* were received by Ms M.S. Uma, Mr R. Narayanappa and Ms Jayamma under different categories.



NBAIR participates in fall armyworm awareness meeting in Tripura

NBAIR scientists Drs T. Venkatesan, G. Sivakumar and M. Mohan participated in the “Farmers' Awareness Programme on the Invasive Pest Fall Armyworm *Spodoptera frugiperda*” organised by the Krishi Vigyan Kendra (KVK) Sepahijala, Tripura, on 15 October 2019. Around 50 farmers participated in the programme. Lectures were delivered on the management of fall armyworm through microbials, macrobials and other non-chemical control measures, including pheromone traps. Mr Ardhendu Chakraborty, SMS (Plant Protection), KVK Khowai, explained the available management strategies for the fall armyworm. Dr Shatabisha Sarkar, Senior Scientist and Head, KVK Sepahijala, delivered a lecture on the scientific practices to be followed to tackle the pest. Dr Utpal Dey, SMS (Plant Protection), KVK Sepahijala, stressed the importance of pest identification for choosing the correct management strategy. NBAIR experts explained how the pest and the damage symptoms could be recognised, and demonstrated the biocontrol technologies and non-chemical approaches, including pheromone traps, developed by NBAIR to contain this serious pest.



NBAIR and CABI jointly organise a training programme on mass production of fall armyworm biocontrol agents

NBAIR and CABI jointly organised a “Training Programme on Mass production of Biocontrol Agents for the Management of Fall Armyworm” during 27–28 December 2019 in Bengaluru. NBAIR Scientists Drs A.N. Shylesha, N. Bakthavatsalam and Richa Varshney along with Dr Malvika Chaudhary, CABI's Asia Regional Coordinator – Plantwise, coordinated the programme. Fifteen participants comprising farmers, consultants, plant doctors and scientists participated in the training programme. The participants were trained on mass production of macrobial and microbial biocontrol agents.



Swachhata Hi Seva activity at NBAIR

NBAIR organised “Swachhata Hi Seva 2019”, a campaign on plastic waste-free environment, from 11 September to 2 October 2019. A guest lecture on “Gandhian principle and how to implement Swachh Bharat in our work place” was delivered by Mr M. Santhosh Kumar, Assistant Director, Department of Solar Energy, Mahatma Gandhi Institute of Rural Energy and Development. He elaborated on the importance of segregation of biodegradable waste and non-biodegradable wastes like plastics and suggested to go for recycling of waste at the office as well as at home. Poem writing and elocution competitions on Swachh Bharat and plastic waste management were arranged and prizes were distributed.



Blood donation camp at NBAIR

NBAIR organised a voluntary blood donation camp on 23 November 2019. The camp was conducted by the Yelahanka Lions Blood Bank, Yelahanka New Town, Bengaluru. The medical officer Dr Mahesh and Camp-in-Charge Officer Mr L. Ravi along with their team of technical professionals collected 18 units of blood in the camp. Around 30 staff (both permanent and contractual) and their family members participated in this noble cause.



Transfer of technology

NBAIR transferred the technology “Waste to Wealth: Technology on Black Soldier Fly-Mediated Bioconversion of Farm and Kitchen Wastes” to Mr Vijay Ganesan, an entrepreneur based in Salem, Tamil Nadu, on 23 October 2019.



NBAIR at Krishi Mela

NBAIR showcased its products and technologies at the “Krishi Mela – 2019” organised by the University of Agricultural Sciences, Bengaluru, during 24–27 October 2019.



NBAIR observes International Day of Persons with Disabilities

NBAIR observed the “International Day of Persons with Disabilities” on 3 December 2019. Differently abled children and office-bearers from Ashankura (BEL Special School) were felicitated by NBAIR for their continued interest in mass production of biocontrol agents. NBAIR has been actively involved in training the students of Ashankura on preparing 'Trichogramma' pouches, which are used in the management of the fall armyworm. This formed a part of their other activities like printing greeting cards and so on. A cultural programme was arranged for the visitors, after which they were exposed to the activities of NBAIR through a poster presentation.



Vigilance Awareness Week observed at NBAIR

Observance of “Vigilance Awareness Week 2019” at NBAIR commenced with ‘Integrity Pledge’, which was taken by all the staff under the theme ‘Integrity – A way of life’. Further, Dr M. Nagesh, Vigilance Officer of NBAIR, facilitated the staff to take e-pledge as prescribed by the Under Secretary, Vigilance Cell, ICAR, New Delhi.



NBAIR celebrates Constitution Day

NBAIR celebrated the “Constitution Day” (aka “Samvidhan Divas”) on 26 November 2019 to commemorate the adoption of the Constitution of India, and to honour and acknowledge the contribution of the Founding Fathers of the Constitution. The Preamble to the Constitution of India was read in English, Hindi and Kannada by all the staff of the bureau.



NBAIR scientists at international and national meetings

XIX International Plant Protection Congress 2019



Dr Chandish R. Ballal, Director, NBAIR, delivered a keynote address on “Biological Control: expect the unexpected” at the “XIX International Plant Protection Congress 2019 (IPPC 2019)” held during 10–14 November 2019 at the International Convention Centre, Hyderabad.

Other invited speakers from NBAIR were: Drs B. Ramanujam, M. Nagesh, A.N. Shylesha, Sunil Joshi, K. Subaharan, M. Mohan, A. Kandan, Ankita Gupta, K.J. David, Jagadeesh Patil, Richa Varshney and Veeresh Kumar.

NBAIR conducted a satellite symposium on “Biological Control: Prospects and Associated Challenges” during the congress.



INSA meeting

Dr Chandish R. Ballal, Director, NBAIR, delivered an invited lecture on “Challenges of Indian agrobiodiversity including pests and non-pest resources” at the “85th Anniversary General Meeting” of the Indian National Science Academy (INSA) held on 17 December 2019 at the CSIR–National Institute of Oceanography, Goa.



Foreign deputation

Dr K. Selvaraj, Scientist at NBAIR, was deputed as a Visiting Scientist to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the private firm Bugs for Bugs in Australia from 23 September to 1 October 2019 under the guidance of Dr Raghu Sathyamurthy, Principal Senior Scientist, CSIRO, Dutton Park, Brisbane. At the Donnybrook facility of Bugs for Bugs, Dr Selvaraj underwent hands-on training on mass production of the parasitoids *Eretmocerus hayati* and *Encarsia lutea*

for large-scale release against the silverleaf whitefly, *Bemisia tabaci*. His training programme also included biological control of invasive species, especially exotic weeds.

Awards and Recognitions

The following NBAIR staff received various awards from Dr B. Vasantharaj David Foundation at the “National Conference on Trends in Higher Education, Taxonomy, Agriculture, Biotechnology & Toxicology” in Chennai on 17 November 2019:

Dr Chandish R. Ballal	Dr Jagadeesh Patil
Dr M. Nagesh	Dr S. Salini
Dr T. Venkatesan	Dr K.J. David
Dr K. Subaharan	Dr M. Sampath Kumar
Dr M. Mohan	Dr K. Selvaraj
Dr G. Sivakumar	Dr U. Amala
Dr K. Sreedevi	Dr Richa Varshney
Dr R. Gandhi Gracy	Ms R.R. Rachana
Dr G. Mahendiran	Dr Y. Lalitha
Dr Ankita Gupta	



Best Worker Awards received by NBAIR staff under different categories during the 26th “Foundation Day” on 19 October 2019:

Dr K. Subaharan, Principal Scientist – Scientific Category
Dr A. Raghavendra, Senior Technical Assistant – Technical Category

Ms S. Kaveriamma, Private Secretary to Director – Administrative Category

Mr P. Nagaiah, Skilled Supporting Staff – Supporting Category

Dr R. Gandhi Gracy, **Dr M. Pratheepa** and **Mr B.I. Mohammed Mazhar** received the **Dr R.J. Rabindra Team Award – 2019** for their research work on molecular entomology, insect genomics and database development.

Sports awards

Ms L. Lakshmi, Assistant Chief Technical Officer, bagged the second place in javelin throw, and **Mr K.M. Venugopala**, Laboratory Technician, bagged a bronze medal in 100-m race at the “ICAR Southern Zonal Tournament – 2019” organised by the ICAR–Central Institute of Fisheries Technology in Kochi during 4–8 November 2019.



Selected Publications

Rachana, R.R., Mound, L.A. & Rayar, S.G. 2019. Tryphactothripini of India (Thysanoptera, Thripidae, Panchaethripinae), with identification keys and a new record of *Opimothrips*. *ZooKeys*, 884: 43–52.

Rachana, R.R., Rachana, B. & Rayar, S.G. 2019. Redescription of *Aduncobrips asiaticus* (Ramakrishna and Margabandhu) (Thysanoptera: Aeolothripidae) with first description of the male. *Oriental Insects*, 52: 1–4.

Shyam, M., Johnson, Th., Rachana, R.R., Varatharajan, R. & Mound L.A. 2019. Redescription and lectotype designation of *Gynaikothrips microchaetus* Ananthakrishnan & Jagadish (Thysanoptera: Phlaeothripidae). *Zootaxa*, 4701: 588–590.

Sreerama Kumar, P. 2019. A not-so-comic take on insects going extinct. *American Entomologist*, 65 (4): 236.

Zargar, M., Gupta, A., Talebi, A.A. & Farahani, S. 2019. Three new species and two new records of the genus *Cotesia* Cameron (Hymenoptera: Braconidae) from Iran. *European Journal of Taxonomy*, 571: 1–25.

Zargar, M., Gupta, A., Talebi, A.A. & Farahani, S. 2019. Description of a new species of the genus *Denterixys* (Hymenoptera: Braconidae: Microgastrinae) from Iran. *Biologia*, 75: 267–272.

ATTENTION! The Sixth National Conference on Biological Control has been postponed. New dates will be announced soon.
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Compiled and edited by: **P. Sreerama Kumar, U. Amala & Chandish R. Ballal**

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Phone: +91 80 2341 4220 ♦ Fax: +91 80 2341 1961 ♦ Website: www.nbair.res.in

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