



Collecting insects: overriding an ethical imperative

Salim Ali's view that 'purposeless killing is an act of vandalism that deserves the severest condemnation' is as true of birds as of insects or any other form of life (plants and microbes included). The vast majority of taxonomists have either killed or endorsed the killing of organisms to enable them to undertake serious studies of the group they are working on. An entomologist takes far more lives (of insects) than one studying most other groups of organisms. I have often heard people say that it is possible to identify insects, especially in today's world where one can employ the techniques of advanced digital photography and examine the images of insects in as great detail as was ever possible with the specimens themselves. And they quote the example of birds, many of which can today be identified from high resolution field photographs (without the specimens themselves before the taxonomist). This however is an analogy that is invalid on at least two counts.

As the peerless naturalist EHA (Edward Hamilton Aitken) wrote in the late 19th century, 'butterfly [read insect]-hunting is a means, not an end. The end is to know them'. Concluding a delightful and insightful essay on hunting butterflies, he went on to state that those children who progress from an initial interest in large wild animals to become true naturalists transition from

a love for wild beasts like the lion and tiger to birds and then as they blossom to become mature naturalists go down the scale of life to find fascination in gall-flies, ensign wasps and other lower forms of life – a fascination that is not to be found in 'what are called the higher forms of life'.



While almost all birds have been collected and named from around the world, the vast majority of insects are unknown with a staggering number remaining to be collected, let alone studied. Salim Ali, who did not enjoy killing birds, "had no doubt that but for the methodical collecting of specimens in [his] earlier years – several thousands [of them], alas – it would have been impossible to advance our taxonomical knowledge of Indian birds." Extending this logic from ornithology to the domain of entomology, we still have to kill lakhs, if not millions, of insects if we are to 'advance our knowledge of Indian insects.'

I shall move from the realm of the ethical to a more pragmatic argument for killing to study insects in the next issue of this newsletter.

Prashanth Mohanraj
Director (Acting)

Director-General, ICAR, lays the foundation stone for Indian Agricultural Insect Museum and National Repository

Dr Trilochan Mohapatra, Secretary (DARE) & Director-General (ICAR), laid the foundation stone for 'Indian Agricultural Insect Museum and National Repository' at NBAIR on 20 May 2016. The museum is being built as per international standards and is expected to house lakhs of insect and other arthropod specimens. Dr H. Rahman (Deputy Director-General, Animal Science, ICAR) and Dr N.K. Krishna Kumar (Deputy Director-General, Horticultural Science) graced the occasion. Dr Mohapatra visited the present insect museum and briefly reviewed the research activities of the Bureau. Addressing the scientists, he stressed the need for more research on the evolutionary biology, genetics, ecology and behaviour of insects. He also appreciated the activities of the institute and noted that the legacy of biological control inherited from the Project Directorate of Biological Control was being carried forward.



Research Highlights

Unusual *Cotesia* species

The unusual species of *Cotesia* with the first tergite narrowing at midlength were reviewed in the studies of the world fauna of Microgastrinae (Hymenoptera, Braconidae). One new species, *Cotesia trabalae* Gupta, 2016 (Fig. 1) was described from India (Himachal Pradesh, Meghalaya and Kerala) and compared with *Cotesia pistrinariae* from Africa, the only other species sharing the same character of all the described species worldwide. The new species is a gregarious larval endoparasitoid of the lepidopteran *Trabala vishnou* (Fig. 2).



Fig. 1: *Cotesia trabalae*



Fig. 2: Parasitised *Trabala vishnou* caterpillar

New species and a new record of *Bactrocera*

Two new species, *Bactrocera (Calodacus) harrietensis* Ramani & David from Andaman and Nicobar Islands, and *Bactrocera (Calodacus) chettalli* David & Ranganath from Karnataka (Fig. 3), were recently described. They were reared from the fruits of *Spondias pinnata* (Anacardiaceae). *Bactrocera (Zeugodacus) semongokensis* has been recorded for the first time in India.

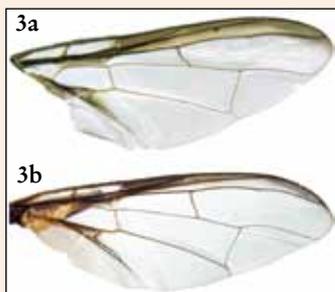


Fig. 3: Wing differences between *Bactrocera (Calodacus) harrietensis* (3a) & *Bactrocera (Calodacus) chettalli* (3b)

Conference announcement

The “Fifth National Conference on Biological Control: Integrating Recent Advances in Pest and Disease Management” will be held in Bengaluru from 9–11 February 2017. Five new awards will also be given away during the conference. Further details on the conference and awards are available at www.nbair.res.in/SBA/.

Biocontrol Workshop

The “XXV Workshop of All-India Coordinated Research Project on Biological Control of Crop Pests” was conducted at the Andhra University campus in Visakhapatnam from 17–18 May 2016. The objective of this yearly meeting was to review the progress of work at all the centres under the network during 2015-16, and to chalk out the future technical programme. Top administrators and scientists, including Dr B.M.C. Reddy (Vice-Chancellor, Dr YSR Horticultural University), Dr C.A. Viraktamath (RAC Chairman, NBAIR), Dr N.V. Naidu (Director of Research, ANGRAU), Dr T. Ramesh Babu (Dean of Agriculture, ANGRAU), Dr K Raja Reddy (Director of Extension, ANGRAU) and Dr N. Venugopala Rao (ADR, ANGRAU), attended the workshop. Addressing the gathering, Dr P.K. Chakrabarty, Assistant Director-General (Plant Protection & Biosafety), ICAR, emphasised the need to cover more cropping area under biocontrol through large-scale demonstrations. He also wanted increased coordination among different crop-based AICRPs, SAUs and ICAR institutes. He highlighted the importance of molecular signatures in registering microbial biopesticides, and suggested that more focus should be directed towards the management of pathogens on different crops under the AICRP on Biocontrol. Several publications, including an e-book entitled ‘Biological control of sugarcane pests’, were released on the occasion. Dr Abraham Verghese (Director, NBAIR & Project Coordinator, AICRP) presented the salient achievements of the AICRP for 2015-16. Biocontrol scientists from across the country and several biocontrol entrepreneurs participated in the meeting.



Interactive Meeting on Tea Shot-hole Borer Management in Valparai

NBAIR and UPASI Tea Research Foundation (UPASI-TRF) jointly organised a “National-Level Interactive Meeting on Tea Shot-hole Borer Management with Special Reference to Fungal Endosymbionts” at Anamalai’s Club, Valparai, in Tamil Nadu on 19 April 2016. Scientists of NBAIR and UPASI-TRF, tea growers and advisory officers of regional centres of UPASI-TRF attended the meeting. Dr B. Chandra Mouli (Advisor, UPASI-TRF) inaugurated the meeting. Dr G. Sivakumar (Principal Investigator of the project “Feasibility of suppression of tea shot-hole borer, *Euw Wallacea fornicatus*, through its mutualistic *Fusarium* spp.”) presented an overview of the research project. The discussion and interaction with tea growers centered on the borer pest, intervention of microbial endosymbionts in its management and other aspects of insect pest management. Dr Abraham Verghese (Director, NBAIR) released the technical folder ‘Intervention of fungal endosymbionts in the management of tea shot-hole borer’ on the occasion.



Research Advisory Committee Meeting

The “XX Meeting of the Research Advisory Committee” was held at NBAIR on 6 May 2016. The committee consisting of Dr C.A. Viraktamath (Chairman), Dr Balwinder Singh, Dr M. Venkat Rajam and Mr N.G. Lakshminarayan (Members) reviewed the progress and research achievements, and gave suggestions for future research. At the outset, Dr Abraham Verghese (Director, NBAIR) welcomed the committee and provided a glimpse of last year’s salient findings. The divisional heads, Dr Prashanth Mohanraj, Dr S.K. Jalali and Dr Chandish R. Ballal, presented the research achievements. On the occasion, Dr Viraktamath released a folder entitled ‘A pictorial guide for the identification of some major armoured scale insects’.



Field demonstration of EPNs for sugarcane root grub management



A field demonstration on WP formulations of the entomopathogenic nematodes (EPNs), *Heterorhabditis indica* and *Steinernema carpocapsae*, was organised by NBAIR in cooperation with the Primary Agriculture Co-operative Credit Society at Sunkathonnur in Mandya district of Karnataka on 25 June 2016. Dr Jagadeesh Patil (Scientist) addressed the farmers and provided information on the occurrence, distribution and the damage caused by root grubs to sugarcane crop. He demonstrated the EPN application technology in a sugarcane field infested with *Holotrichia serrata* grubs. In an open discussion with around 50 farmers, suggestions were mooted to adopt this ecofriendly method under the package of practices for root grub management. NBAIR distributed 50 kg of the formulations to the participating farmers. Also, Dr Sunil Joshi (Principal Scientist) and Dr R. Gandhi Gracy (Scientist) interacted with the farmers and suggested control measures for the sugarcane woolly aphid, another concern in that area.

Dr Abraham Verghese retires from ICAR

Dr Abraham Verghese superannuated on 31 May 2016 after an illustrious career spanning more than three decades in Agricultural Research Service. Winding down a prolific entomological research profession, Dr Verghese recalled his long association with ICAR in various capacities. Bidding farewell to their Director, the staff members of NBAIR wished him a happy retired life. Dr Prashanth Mohanraj, Head of Division of Insect Systematics, NBAIR, took charge as the Director (Acting).



International Day of Yoga at NBAIR

NBAIR celebrated the “International Day of Yoga” on 21 June 2016. Ms Shilpa Shetty and Mr Puneeth Sachdev, yoga experts from The Art of Living Foundation, conducted the session. The programme started with practising various *asanas*, four kinds of *pranayama*, followed by *dhyana* and concluded with *sankalpa*.



Recently published books

Agrawal, P.K., Verghese, A., Radhakrishna, S. & Subaharan, K. 2016. *Human Animal Conflict in Agro-Pastoral Context: Issues and Policies*. Indian Council of Agricultural Research, New Delhi.

Subaharan, K. & Verghese, A. 2016. *Arthropods Related to Veterinary Animals and Fisheries*. ICAR–National Bureau of Agricultural Insect Resources, Bengaluru.

Recognition

Dr K. Subaharan (Principal Scientist, NBAIR) was invited as a resource person for a workshop on nanotechnology organised by the Mauritius Research Council, Ministry of Technology, Communication and Innovation, Government of Mauritius, from 6–7 April 2016, in Ebene CyberCity. During the meeting, he delivered a talk on ‘Nanotechnological approaches in pest management’.

Selected Publications

David, K.J., Ramani, S., Whitmore, D. & Ranganath, H.R. 2016. Two new species and a new record of *Bactrocera* Macquart (Diptera: Tephritidae: Dacinae: Dacini) from India. *Zootaxa*, 4103: 25–34.

Gupta, A., Shaw, M., Cardinal, S. & Fernandez-Triana, J. 2016. A review of unusual species of *Cotesia* (Hymenoptera, Braconidae, Microgasterinae) with the first tergite narrowing at midlength. *ZooKeys*, 580: 29–44.

Pratheepa, M., Verghese, A. & Bheemanna, H. 2016. Shannon information theory a useful tool for detecting significant abiotic factors influencing the population dynamics of *Helicoverpa armigera* (Hübner) on cotton crop. *Ecological Modelling*, 337: 25–28.

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