

Invertebrate Pollinator Conservation and Education Training Workshop

Report: Conservation Beyond Research

B.A. Daniel



The IUCN SSC South Asian Invertebrate Specialist Group SAISG and Zoo Outreach Organization in partnership with the Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore and The Xerces Society for Invertebrate Conservation, USA organized a three-day training workshop to promote pollinator conservation in India. Thirty-one participants from different states of India took part in this event, conducted at the TNAU campus from 3-5 June 2013. Chester Zoo, Columbus Zoo and Aquarium, and Conservation Breeding Specialist Group sponsored the entire event.

Invertebrates are non-charismatic organisms but they dominate numerically and play a very important ecological role. Pollinators are essential to our environment. The ecological service they provide is necessary for the reproduction of nearly 75 percent of the world's flowering plants and is fundamental to agriculture and natural ecosystems. More than two-thirds of the world's crop species are dependent on pollination, and the global economic value of insect-pollinated crops is



Eric Mader, the primary resource person is welcomed traditionally

estimated to be more than US\$200 billions annually. A growing body of evidence has demonstrated that pollinators are in serious decline, due to habitat loss, modification, and/or fragmentation, excessive pesticide use, diseases, and introduction of alien species. The decline in pollinators must be reversed now, as even current loss suggests an impending crisis. In

South Asian context, very little is known about the status of invertebrate pollinators in the wild and their populations, pollinator interactions with other elements of crop and crop associated biodiversity, the ecology of pollinators, or the ultimate consequences of their decline. There is also a lack of information and knowledge on the enabling environment that contributes to the decline of pollinator numbers.

A realistic way to ensure pollinator conservation is to promote and enhance its value to society. Apart from understanding the need of the multiple goods and services provided by pollinators, it is necessary to promote conservation of pollinators by creating awareness among farmers, students, policy makers and the general public, i.e. civil society at all levels. Considering the importance of pollinators and their decline, it is critical that the decline is slowed down. One of the ways is to increase capacity of entomologists and field biologists to recognize the forces that are depleting pollinators and address



Habitat assessment guideline being introduced

Scientist, ZOO / Chair, IUCN SSC South Asian Invertebrate Specialist Group
daniel@zooreach.org



M.R. Srinivasan demonstrating cubital index calculation in Honey bees

pollinator conservation researchers in India for future conservation action.

Participants for this workshop were selected based on their contribution in pollinator research and through invitation. Dr. E.I. Jonathan, Director (CPPS), TNAU presided over the inaugural function. Dr. S. Kuttalam, Professor and Head, Department of agricultural entomology welcomed the gathering. The author highlighted the background of the workshop. He said, conservation of neglected faunal groups including invertebrates is one of the primary interests of Sally Walker, the founder of Zoo Outreach Organization. The invertebrate network activities initiated by her in 1991 as an

them with appropriate means. With this in mind, a three-day training programme was planned for the pollinator researchers in India under the banner of IUCN SSC South Asian Invertebrate Specialist Group and Zoo Outreach Organization in collaboration with TNAU and Xerces Society.

The main objectives of the workshop were i) to convey practical field techniques for use for pollinator studies; ii) to highlight what has become a crisis of pollinators and the role of invertebrate as pollinators; iii) to teach current best practice in survey, identification, land use management etc. and to reinforce their commitment; iv). to imbibe a short training in education of laypersons about the need to conserve invertebrate pollinators and; v). to create a network of committed



Sajan Jose handling bee colonies while Dr Srinivasan explaining the details



Sanjay Molur introducing the IUCN Redlist process

activity of then CBSG-India (now CBSG South Asia) and multi-level invertebrate conservation activities executed with the support of Paul Pearce Kelly, ZSL in 1995, laid foundation for the formation of the IUCN SSC South Asian Invertebrate Specialist Group SAsISG. This pollinator conservation and education training workshop is an activity of the sub-network of the SAsISG. In addition to this he highlighted the objectives of this workshop.

Dr. Eric Mader during the inaugural said that this short course comes at an important time in our history of human. In the past 60 years, roughly 300% global increase in cropland that require bee pollination has happened



Participants observing bee visitation in Sun flower

and in the same time frame we have a considerable amount of decline in pollinators. We have more complete information on pollinator decline in United States, Europe, Canada, Mexico where in the same time frame there is 50% decline in managed honeybee colonies. We are here at a point in the history to appraise if there will be sufficient pollinator numbers in the near future to sustain our nutritional requirements, to sustain our health and to sustain the reproduction of plants which are bee dependent. He also mentioned that after this workshop the participants will walk away with three concrete actions 1. Inspire awareness of pollinators and pollinator conservation 2. Additional ideas for research and 3. To take collective steps for pollinator conservation beyond research. The third step is very critical and it is easy for researchers to get stuck with the second action.

Sanjay Molur, Executive Director, Zoo Outreach Organization highlighted that we have moved to the age where we can, along with research, can start looking at what can we in our present condition, situation, knowledge do for conservation. We all understand our feelings for conservation but we are all stuck in our daily mode of understanding what is more out there.

E.I. Jonathan, Director (CPPS), TNAU while inaugurating the workshop said that it is important to conserve the pollinators which is sensitive to pesticides. Large amount of pesticide is used without understanding the impact of it in the ecosystem. Usage of pesticide must be minimized so that

non-target organisms can be conserved. M.R. Srinivasan, Professor, Department of Agricultural Entomology gave vote of thanks, and particularly thanked ZOO for conceiving the idea of this workshop, Eric Madar, Xerces Society and the sponsors.

The programme started with an introductory talk by Dr. Eric Mäder, Assistant Pollinator Program Director, The Xerces Society for Invertebrate Conservation, the main resource person for the workshop. He gave a talk on the Global trends of pollinator decline and an introduction to the Xerces Society's Pollinator Conservation Programme. Xerces Society, which was started in 1971, is named after the Extinct butterfly Xerces blue butterfly. For the first few decades we were primarily a butterfly conservation organization and then we brainstormed to work on the

Endangered species like the freshwater mussel, we have aquatic invertebrate conservation programmes which is now very active addressing threats to aquatic invertebrates, then we have the pollinator conservation programme. The Xerces Society has three primary methodologies, we do outreach and education targeting farmers and government agencies that support farmers. We do applied research, we try to investigate questions around about pollinator decline and try to identify the threats for the pollinator groups; and then we give direct restoration of habitat for pollinators restoring native flowers and native head rows in agricultural areas. Through this we can able to create significant impact on pollinator numbers and bring in wild pollinators for pollination. Xerces Society is running on 'NGO and Government partnership'.



Stingless bee *Trigona* colony

While addressing the general pollinator status and importance of pollinators he said, pollinators are the integral part of terrestrial ecosystem and in fact current research project shows that 80% of plant species (~240,000 plant species) on earth requires some form of animal mediated pollination for reproduction. Certain plants are pollinator specific. Benefits to other wildlife: Pollinators also play a major role in supporting the global biodiversity. If we look at the food sources for birds and mammals 25% of the fruits and seeds are from the pollinators. Insect Pollinators are food for many wildlife, pollinator habitat is compatible with the needs of other wildlife, such as songbirds. The conservation of pollinators is often compatible with conservation of other wildlife. When we talk about pollinators we talk about a huge spectrum of different animals like butterflies, moths, beetles, wasps and of all bees are considered to be ecologically important group. Bees are important pollinators for three critical reasons: 1. Bees are one of the few animal groups that directly collect and transport pollen. Many other insects like butterflies are visitors to collect nectar. Bees are the only group that actively gather large amount of pollen. 2. They are in the apex of pollination because bees exhibit floral constancy ie bees can visit the same species of flowers in succession. 3. Bees nests in a specific location and the regularly forage in area around the nest. We can put a beehive in an orchard and we can expect pollination to radiate out from the beehive or we can create a habitat on a form for native wild bees and can expect pollination as an ecological event to radiate from there.

As part of the workshop Eric delivered a series of talks and demonstrations. Habitat evaluation: Field observation and land-use discussion; Rapid field habitat assessment and pollinator monitoring techniques; Applied Habitat Restoration for Pollinators; Wild (non-Apis) Bee Ecology. Role of solitary bees, bumble bees and carpenter bees; Managing Stem and Wood Nesting Bees for Crop Pollination; Selection, development, and propagation of native plants for the restoration of pollinator habitat and; Bee-Friendly Farming Practices.

Following the key-note address, the following presentations and demonstrations were conducted. M.R. Srinivasan delivered talks on National pollinator trend and status; honey bee diversity, visit to Sun flower field and pollinator visitation observation and analysis, Demo on apiculture; Basics of identification - Bee identification; Insect pollinators in selected crops - sunflower, cotton, ornamentals, trees and weed plants - pollinators on crop yield and quality increase in different crops. Dr N. Ganapathy spoke about Bee diseases and bee enemies. Dr. Sajan Jose, who has been working on stingless bees for the past 27 years, shared his experience on Milliponiculture.

Sanjay Molur gave a detailed talk on the Status of Indian Invertebrate Pollinators: Checklist, Status of pollinators: Species assessment process; IUCN Red List Criteria. Followed by this B.A. Daniel and Sanjay Molur conducted a discussion to develop a short list to prioritize pollinator groups that can be considered for rapid species assessments in the near future. The identified groups and the commitments



Daniel introducing ZOO's Education materials

by the participants are: Some non-Apis invertebrate pollinator groups identified for species status assessments are: butterflies, stem-nesting solitary wild bees, ground-nesting bees, Syrphid flies, Thrips, Coccinellid beetles, selected moths, nocturnal bees, parasitic bees and wasps and sting-less bees. Sample red list for these groups will be tried.

The pollinator education activities of ZOO's Educator Network was explained by Daniel and he demonstrated the education materials developed by ZOO with the support of Columbus Zoo. All the participants were invited to become a member of the networks of ZOO. During the valedictory, all the participants received a certificate of participation and a CD containing collection of literature related to pollinators. Entire proceedings of the workshop will be compiled and posted on ZOO website. We thank Columbus Zoo, Chester Zoo and CBSG for the financial support extended to conduct this important workshop.

The workshop was hosted by Department of Agricultural Entomology, TNAU

