



## **International Workshop on Ecological Interactions in a Changing World: Applying Seed Dispersal Processes in Asian Landscapes**

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**Date:** 9 -20 June 2018 (12 days)

**Venue:** Mo Singto Long Term Ecological Research Plot, Khao Yai National Park, Thailand

**Organized by:**

- Khao Yai National Park, Department of National Parks, Wildlife and Plant Conservation, Ministry of Natural Resources and Environment
- National Center for Genetic Engineering and Biotechnology (BIOTEC), National Science and Technology Development Agency (NSTDA), Ministry of Science and Technology

**Background:**

The profound importance of mutualistic interactions in today's ecosystems is at odds with the relatively few researchers investigating such processes in Asia, and their absence from most ecological courses in the region. With this course we aim to create better awareness in Asian researchers about the importance of ecological processes and a practical understanding of how to study them. Within the broader framework of ecological interactions and mutualisms, we will impart practical hands-on training in studying and applying the seed dispersal process.

Why is understanding seed dispersal important? Some examples:

- Animals are often the only means by which sedentary plants can move across the increasingly fragmented landscapes that exist today and the only means by which plants can track changing climates. To plan and prepare landscapes for the future, we need to have more people studying the movements of seed dispersing animals in fragmented heterogeneous landscapes.
- The animal communities in habitats today are continually facing change, as animal populations decline or disappear completely. Disperser declines impact the ability of plant species and communities to respond to various disturbances, including climate change. Across large parts of Asia, the empty forest syndrome has left our plants bereft of their mutualist partners. We need to adopt system approaches to address the challenges posed by declining dispersal services in changing landscapes.
- Invasive plants are rapidly spreading across many landscapes, and result in large economic and ecological losses. Incorporating an understanding of dispersal processes that mediate the spread of invasive plants is critical to ensure effective management of invasive plants. Integrating seed dispersal processes into invasive species management improves the effectiveness of management action, in terms of both time and finances.

**Objectives:**

The courses will be developed with the following aims:

1. Promote an understanding of the critical importance of mutualistic interactions in maintaining ecosystems
2. Demonstrate the application of the seed dispersal process to management and conservation
3. Teach key techniques to study seed dispersal mutualisms
4. Develop a network of potential advisors and mentors for students in their post-graduate studies

**Instructors:**

- Dr. David Westcott CSIRO, Australia
- Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
- Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia
- Mr. Kunchit Srinoppawan Khao Yai National Park, Thailand
- Dr. Pilai Poonswad Mahidol University, Thailand

**Training Assistant:**

- Dr. Chanpen Saralamba Mahidol University, Kanchanaburi Campus, Thailand
- Mr. Phitaya Chuailua Thailand Hornbill Project, Thailand
- Mr. Narong Jirawatkavi Thailand Hornbill Project, Thailand
- Ms. Anuttara Nathalang National Center for Genetic Engineering and Biotechnology, Thailand
- Ms. Jantima Santhon National Center for Genetic Engineering and Biotechnology, Thailand

**Target group:**

Researchers, research assistants and student with background in biology, ecology and forestry

**Number of participants:** 25 participants

**Language:** The whole course will be given in English without translation

**Registration fee:**

- International Delegate 350 USD
- Thai Delegate 7,000 THB

The above fees are inclusive of VAT 7% and followings;

- Workshop material
- Roundtrip transportation between Bangkok and Khao Yai National Park
- Breakfast, lunch, refreshment and dinner during the workshop period
- Travel Insurance during workshop period (9 – 20 June 2018)
- Accommodation (Dorm) at Khao Yai National Park during the workshop period (11 nights). Organizers reserve the right to organize the rooms. Male and Female will be allocated separately.

**Equipment and supplies needed:**

All participants must bring their own the following equipment;

- Binoculars (*if possible*)
- Laptop (*if possible*)
- Raincoat, Rain jacket and warm jacket
- Brimmed hat
- Short-sleeve shirt
- Long-sleeve shirt
- Pair long pants
- Trekking shoes or hiking boots and socks
- Leech socks (*Be able to purchase at visitor center in Khao Yai National Park*)
- Umbrella
- Small backpack
- Flashlight/headlamp
- Insect repellent
- Water bottle
- Any medications you will specifically need to take during the trip (*We will provide First-aid kit except specific medications*)

**Registration Deadline:** 25 May 2018 or when the course is full

**Certificate:**

All participants who attend the workshop at least 80% will receive the certificate.

**General Information:**

- **Public transportation to the meeting point (BIOTEC Building, Thailand Science Park, Phatum Thani)**

Air-conditioned bus routes:

- No. 29 (Bangkok Railway Station - Thammasart University, Rangsit)
- No. 39 (Grand Palace - Thammasart University, Rangsit)
- No. 510 (Victory Monument - Thammasart University, Rangsit - Thai Market)

Air-conditioned van routes:

- No. 118 (Mo Chit BTS Sky Train Station - Thailand Science Park)
- No. 85 (Victory Monument - Thammasart University, Rangsit )

- **Preparation to Travel Khao Yai National Park**

All should dress in plain-color outfit harmonious with nature, for examples, in gray, blue, green, or brown color that makes you have better chance in finding animals on trekking trails. Dressing in long sleeve shirt and full-length trouser can protect you from being bitten by mosquito and other insects. Khao Yai National Park has many leeches so you should wear socks and shoes to prevent their foot from being bitten by the leeches (but beware, they can climb to bite other parts of your body).

**For more information please contact**

Technical Training Unit, BIOTEC

113 Thailand Science Park, Phahonyothin Rd.,

Khlong Nueng, Khlong Luang, Pathum Thani 12120 Thailand

Tel: (66) 2564 6700 ext 3379 – 82 Fax: (66) 2564 6574

E-mail: [TrainingUnit@biotec.or.th](mailto:TrainingUnit@biotec.or.th)

**Tentative program:**

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**Day 1: Saturday, 9 June 2018**

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12.30 - 13.30	Registration at the meeting point, BIOTEC Building, Thailand Science Park, Pathum Thani
13.30	Travel to Khao Yai National Park
18.00	<b>Welcome remark</b> By Mr. Kunchit Srinoppawan Chief of Khao Yai National Park

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**Day 2: Sunday, 10 June 2018**

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07.30	Breakfast
08.30 - 12.00	<b>Lecture on "Introduction: to ecological interactions and seed dispersal"</b> By Dr. David Westcott CSIRO, Australia <b>Lecture on "Phenology theory, fruit morphology, fruit displays"</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia
12.00 - 13.00	Lunch
13.00 - 16.30	<b>Lecture on "Asia focus: Importance of studying these interactions in Asia (esp. South-east Asia)"</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia
17.30	Dinner

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**Day 3: Monday, 11 June 2018**

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07.30	Breakfast
08.30 - 13.00	<b>Collecting phenology data; collect fruit for measurements and description (field)</b> <i>Remark: have lunch during field trip</i>
13.00 - 16.30	<b>Lecture on "Functional groups"</b> By Dr. David Westcott CSIRO, Australia <b>Practice on "Measuring and describing fruit and seeds"</b>
17.30	Dinner
19.00 - 20.00	<b>Lecture on "Introduction to next few days: Focal and scan sampling, collecting movement data"</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India and Dr. David Westcott CSIRO, Australia

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**Day 4: Tuesday, 12 June 2018**

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07.30	Breakfast
08.30 – 13.30	<b>Watching fruit tree / Following gibbon / Measuring fruit fall</b> <i>(Remark: participants will be split into 3 groups and each group will do a different activity each day &amp; have lunch during field trip)</i>
13.30 – 16.30	<b>Lecture on “Estimating seed shadows”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
	<b>Lecture on “Janzen-Connell”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
17.30	Dinner
19.00 – 20.00	<b>Lecture on “Use of genetics in frugivory and seed dispersal”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia

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**Day 5: Wednesday, 13 June 2018**

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07.30	Breakfast
08.30 – 13.30	<b>Watching fruit tree / Following gibbon / Measuring fruit fall</b> <i>(Remark: participants will be split into 3 groups and each group will do a different activity each day &amp; have lunch during field trip)</i>
13.30 – 16.30	<b>Lecture on “Animal movement, gut-passage rates and seed dispersal”</b> By Dr. David Westcott CSIRO, Australia
	<b>Lecture on “Seed dispersal effectiveness”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia

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**Day 6: Thursday, 14 June 2018**

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07.30	Breakfast
08.30 – 13.30	<b>Watching fruit tree / Following gibbon / Measuring fruit fall</b> <i>(Remark: participants will be split into 3 groups and each group will do a different activity each day &amp; have lunch during field trip)</i>
13.30 – 16.30	<b>Practice on “Analyzing movement data”</b> By Dr. David Westcott CSIRO, Australia
17.30	Dinner
19.00 – 20.00	<b>Practice on “Tagging seeds”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia

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**Day 7: Friday, 15 June 2018**

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07.30	Breakfast
08.30 – 12.00	<b>Lecture on “Interaction networks within populations: abundances, space and time”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
	<b>Practice on “Seed dispersal game”</b> By All instructors
12.00 – 13.00	Lunch
13.00 – 16.30	<b>Practice on “Analyzing population data”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
17.30	Dinner
19.00 – 20.00	<b>Lecture on “Hornbill”</b> By Dr. Pilai Poonswad Mahidol University, Thailand

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**Day 8: Saturday, 16 June 2018**

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07.30	Breakfast
08.30 – 12.00	<b>Hornbill trekking (<i>field</i>)</b>
12.00 – 13.00	Lunch
13.00 – 16.30	<b>Lecture on “Nutritional aspects of fruit-frugivore interactions”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia
	<b>Lecture on “Seed predation and secondary dispersal”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia
17.30	Dinner
19.00 – 20.00	Lecture on “ <b>Using camera-traps: Terrestrial and canopy use</b> ” By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India

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**Day 9: Sunday, 17 June 2018**

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07.30	Breakfast
08.30 – 12.00	<b>Seed predation experiment; set-up cameras (<i>field</i>)</b>
12.00 – 13.00	Lunch
13.00 – 16.30	<b>Lecture on “Interaction network within communities”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
	<b>Lecture on “Introduction to conservation issues”</b> By Dr. David Westcott CSIRO, Australia
17.30	Dinner
19.00 – 20.00	<b>Lecture on “Frugivore loss (focus on megafaunal mutualisms)”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia

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**Day 10: Monday, 18 June 2018**

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07.30	Breakfast
08.30 – 12.00	<b>Lecture on “Fragmentation and seed dispersal”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
	<b>Lecture on “Plant invasions and seed dispersal”</b> By Dr. David Westcott CSIRO, Australia
12.00 – 13.00	Lunch
13.00 – 16.30	<b>Practice on “Complete analyses; explain results”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India and Dr. David Westcott CSIRO, Australia
17.30	Dinner
19.00 – 20.00	<b>Lecture on “Cryptic functional losses”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia

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**Day 11: Tuesday, 19 June 2018**

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07.30	Breakfast
08.30 – 12.00	<b>Retrieve cameras; search for tagged seeds (<i>field</i>)</b>
12.00 – 13.00	Lunch
13.00 – 16.30	<b>Practice on “Check cameras; explain results”</b> By Dr. Kim McConkey National Institute of Advanced Studies, India, and University of Nottingham, Malaysia Campus, Malaysia
	<b>Lecture on “Climate change and seed dispersal”</b> By Assist. Prof. Soumya Prasad Jawaharlal Nehru University, India
17.30	Dinner
19.00 – 20.00	<b>Summary</b>

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**Day 12: Wednesday, 20 June 2018**

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07.30	Breakfast
08.30	Travel to Bangkok
12.00	Arrive BIOTEC Building, Thailand Science Park, Pathum Thani