INSECT DIAGNOSTICS IN PLANT BIOSECURITY
Technical Training Course
2022 Program

Objectives

The objective of the training is to strengthen diagnostic output and workflow by providing diagnostic skill development, confidence, tools and materials for family-level diagnostic triage required by many biosecurity or plant health laboratories in Australia. The course framework was developed based on a survey by the Entomological Skills project at ANIC-CSIRO and the Department of Agriculture, Water and the Environment (DAWE). The aim of the training is to contribute to the strengthening of the Australian biosecurity system.

Core of the course

1. Identification skills
2. Identification knowledge
3. Diagnostic resource use
4. Background entomological knowledge
5. Communication
6. Collection, preparation and curation skills

The major emphasis is on practical identification for triage. Specific goals are listed in order of priority below.

Specific goals

1. Identify and describe key morphological and anatomical features of insects and use this knowledge to differentiate between insect Orders
2. Become familiar with insects to family level across a broad range of taxa (especially the insect orders containing many pests)
3. Properly use microscopes to examine external and internal characteristics of insects
4. Decide the most efficient method for diagnosis of any particular specimen (*i.e.* being aware of when molecular techniques are more appropriate for identification than morphological approaches, and vice versa)
5. Become familiar with diagnostic resources (on-line resources, diagnostic protocols, image databases, keys, taxonomic literature)
6. Understand the limitations of both diagnostic resources (*i.e* not forcing an identification) and a specimen (*e.g.* life stage and/or sexual dimorphisms) when using identification keys
7. Understand the principles and practice of insect taxonomy and nomenclature
8. Understand insect life cycles, particularly the presence and differences of each insect life stage and sex
9. Communicate (both oral and written) to navigate diagnostic networks and communicate with other diagnosticians, specialists, laboratories, and agencies, in order to convey technical information and access other sources of expertise
10. Identify (using appropriate resources) important insect pests, including exotic species, and recognise disease symptoms or activity on their hosts
11. Gain proficiency and knowledge in proper insect collection, preservation, curation, and packaging so that a wide variety of collected insect specimens will be identifiable by experts
12. Understand and use a comprehensive vocabulary of precise terms to describe morphological and anatomical traits of insect specimens in detail

When: **20-24 June 2022**

Where: Canberra (Australian National University)

Instructors:

1. Manda Khudhir (MK) (general entomology, collecting, preservation and vouchering)
2. Mike Hodda (MH) (Termitoidae, insect taxonomy and nomenclature, identification resources)
3. Adam Slipinski (AS), Hermes Escalona (HE), Lingzi Zhou (LZ) & James Bickerstaff (JB) (Coleoptera)
4. Andreas Zwick (AZ), Youning Su (YS) & Thekla Pleines (TP) (Lepidoptera)
5. Youning Su (YS) (Orthoptera)
6. Juanita Rodriguez (JR) & Madalene Giannotta (MG) (Hymenoptera)
7. Keith Bayless (KB) (Diptera)
8. Olivia Evangelista (OE) (Hemiptera, insect taxonomy and nomenclature)
9. Ben Hoffman (BH) & Jon Lewis (JL) (Hymenoptera - Ants)
10. Jaime Florez (JF) (packaging and sending vouchers)

Participants:

Maximum 15

Tentative Course Schedule – (20-24 June)

Time	Day 1	Presenters	Day 2	Presenters	Day 3	Presenters	Day 4	Presenters	Day 5	Presenters
9:00			Lepidoptera	AZ, YS, TP	Principles and practices of insect taxonomy and nomenclature	OE, MH	Hymenoptera	JR, MG	Termitoidae	MH
10:30	Morning tea		Morning tea		Morning tea		Morning tea		Morning tea	
11:00	Introduction and Pre-assessment, basic insect biology and morphology	MH, MK	Lepidoptera	AZ, YS, TP	Specimen collection and preservation, packaging, sending and submission to reference collections	MK, JF	Hymenoptera	JR, MG	Orthoptera	YS
12:30	Lunch		Lunch		Lunch		Lunch		Lunch	
1:30	Diptera	KB	Hymenoptera (Ants)	BH, JL	Hemiptera	OE	Coleoptera	HE, AS, LZ, JB	Classification and identification tools, post-assessment, tour of ANIC	MK, MH
3:00	Afternoon Tea		Afternoon Tea		Afternoon Tea		Afternoon Tea			
3:30	Diptera	KB	Hymenoptera (Ants)	BH, JL	Hemiptera	OE	Coleoptera	HE, AS, LZ, JB		