Insect Classification

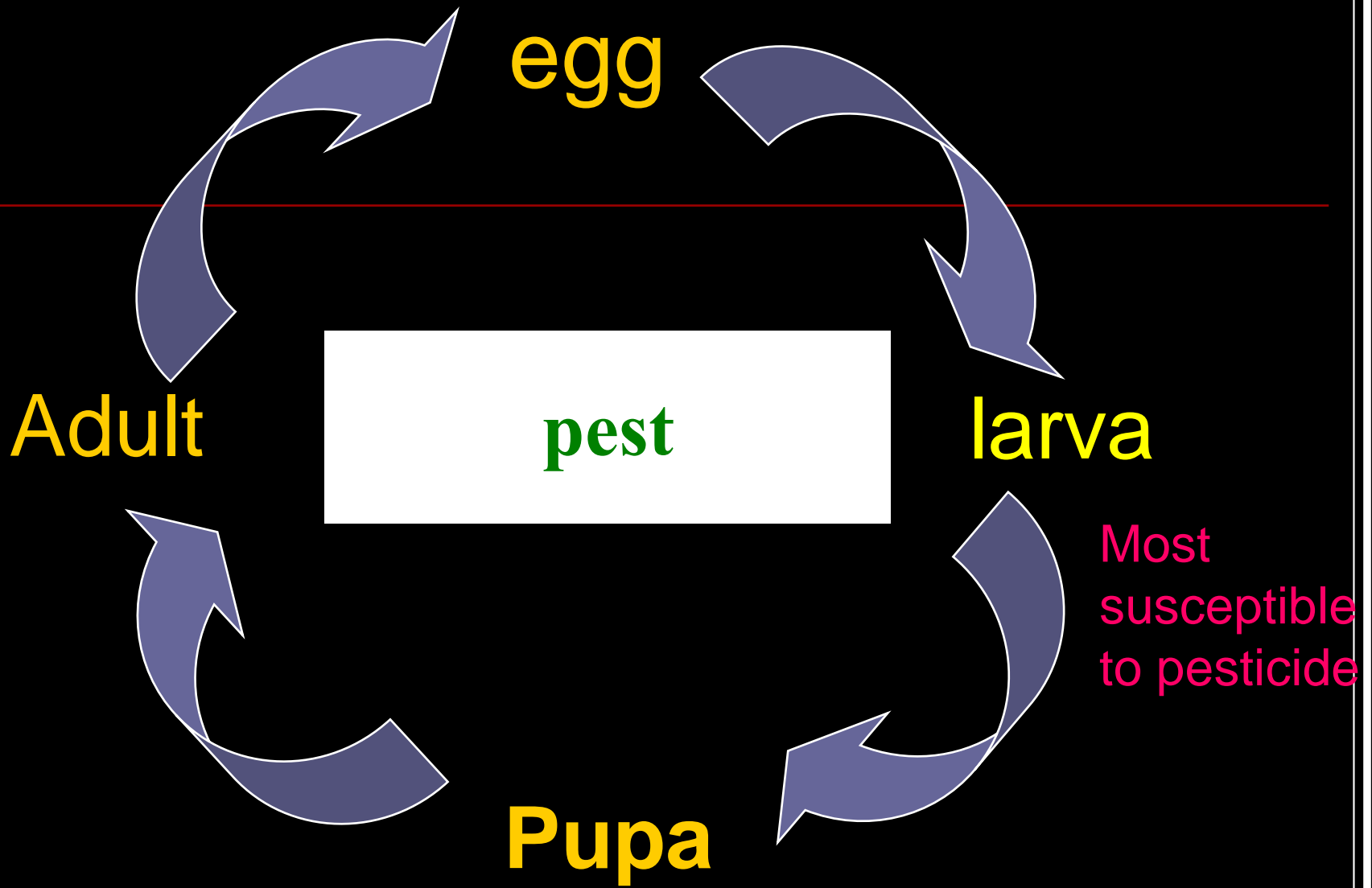## World of Insect

egg

larva

Most
susceptible
to pesticide

Pupa

Adult

pest

Insect

1 million species: 5000 sp. are pests (0.5%)

Exoskeleton

Molting

Body with segment

Habitat :every where

3-4 instars

Eggs   =thick cover or cover with spine

Larva= usually hide under or in host plant

Pupa= cover with thick membrane

Adult= fly fast and far, cover with spine and scale

Special reproductive organ

Produce much and rapid offspring

Adjust & improve themselves depend on environment

Small body, increase population by food

Short life and develop themselves quickly

Insect identification

- More than 1 million scientific name
- Look the same by eye ,need to see the other organ: antenna
- Need microscope to distinguish
- Need fundamental entomology

Insect identification

- Scientific name:Genus species
- Need fundamental Entomology
- Need Key, tool , text , good memory
- Need Taxonomist
- Very few taxonomist in Thailand (world) : specialist only some group of insect.
- Take time to know, until too late.
- After know the name, can we control them?

Objective of ident.

- **For knowledge:** scientific name, insect morphology, biology ต้องรู้ชื่อand charateristic , chemical substanc inside and outside insect body which need to find from expert and taxonomist and Key (difficult learning)

- **For control:** insect eco., life cycle, weather condition, plant health, natural enemies, host plant, mouth part, habitat, symptom of infestation : easily find from monitoring

Agro-eco system analysis

- Know what insect did in the field.

- Know ecology. (no text, no expert,only observe and general knowledge)

- use simple materials.

- Get all data enough to control in time,

Problem

- Identification:difficult, take time
- If wrong ident., wrong decission
- Easily wrong
- Can not solve the problem
- Know only insect, no enough to select te control method.

Insect Classification by functional group

- Insect pest: sucking or chewing
- Natural enemies : predator ,parasitoid, microbial
- Other insect not involve the host plant: visiting insect, temporary live, etc.
- Prove by regular survey: if not concening will stay short time.
- Every insect are related with the other factor

Compare identification/classification

Knowledge	Control
❑ Study	❑ practice
❑ Use Key and Taxonomist	❑ Survey /study/ test or experiment
❑ Need much more knowledge and reference or text book	❑ test by insect zoo

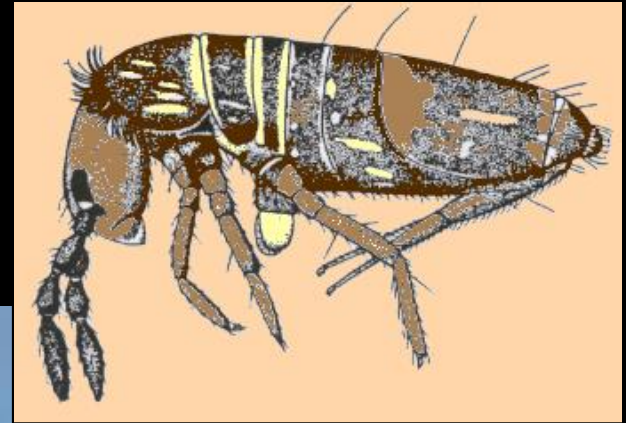# Insect Classification

Classify every insect

Classify by -3 main group

    Pest

    Natural enemies

   Others(General)

Decision making by ratio of Pest and Natural enemies

in stead of use ETL for decision making

Order Collembola

Springtails... (แมลงหางดีด)

Order Ephemeroptera

Mayflies...

naiad
(ตัวชีปะขาว)

Order Odonata

Dragonflies...
(แมลงปอ)

Damselflies...
(แมลงปอเข็ม)

Order Orthoptera

ตั๊กแตน

จิ้งหรีด

แมลงสาบ

แมลงกระชอน

Order Dermaptera

Earwigs...(แมลงหางหนีบ)

แมลงหางหนีบ EARWIG

แมลงช้าง Neuroptera

Order Isoptera

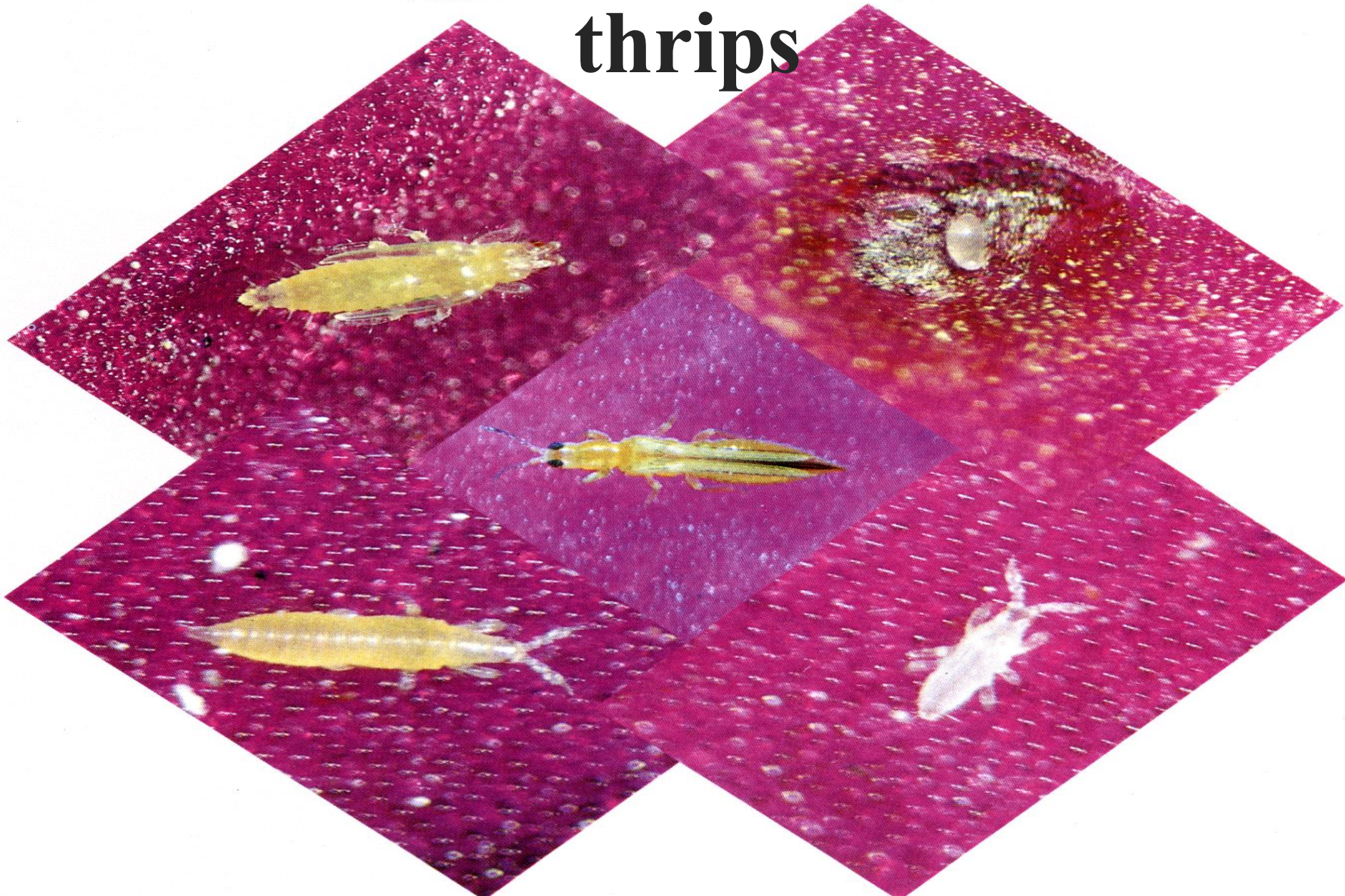**Termites or White ants... (ปลวก)**

Order Thysanoptera

Thrips... (เพลี้ยไฟ)

ดักแด้
ไข่
thrips
ตัวอ่อนระยะที่สอง
ตัวอ่อนระยะแรก

Thrip and predatory thrip

Franklinothrips vespiformis   Predatory thrips
Host: Mites and pest thrips   UCIPM

Order Hemiptera

Bugs... (มวน)

bug
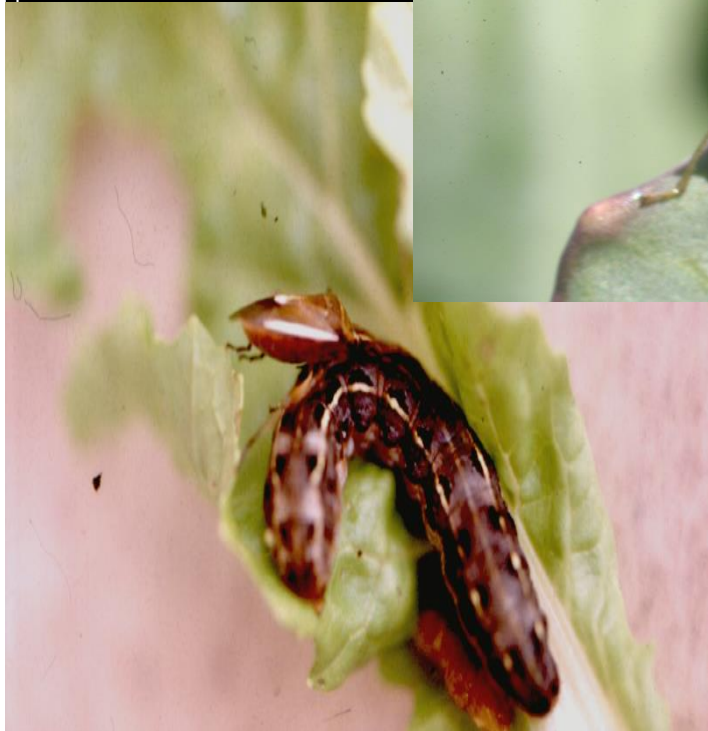
Predatory bug

Predatory bug
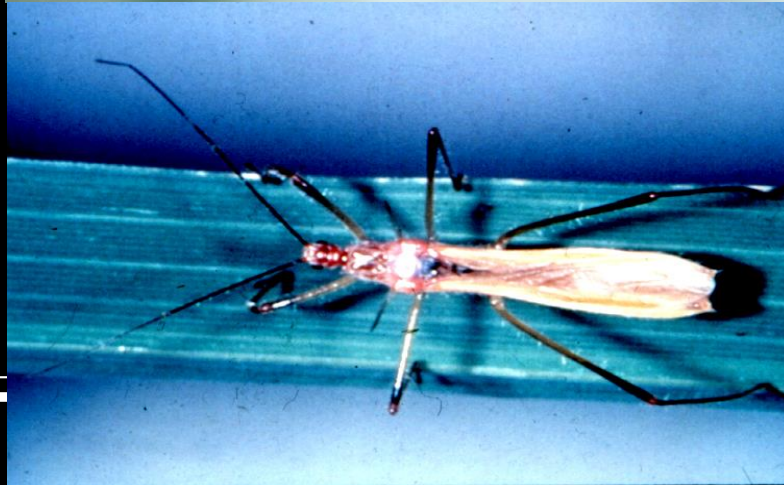
Order Homoptera

hopper

Order Coleoptera

Beetles... (ด้วงปีกแข็ง)

pest (beetle)

Flea beetle

© Clive Lau

Predatory beetle

predator **predator**

Predator

ground beetle

Order Lepidoptera

Butterflies...

Order Lepidoptera

Moth

Lepidoptera

Order Diptera

Flies...

Order Hymenoptera
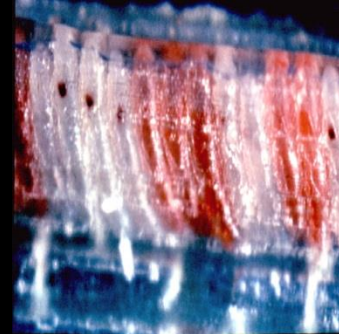
Egg parasitoid
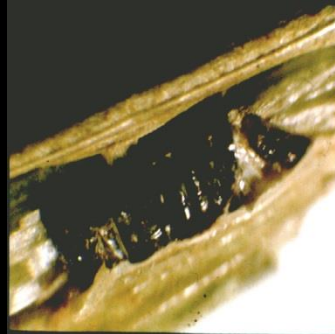
Trichogramma

Ascecodes hispinarum

0.5

แตนเบียนอะซี

parasitoid

parasitoid

BPH parastized eggs

parasitoid

Mite and predatory mite
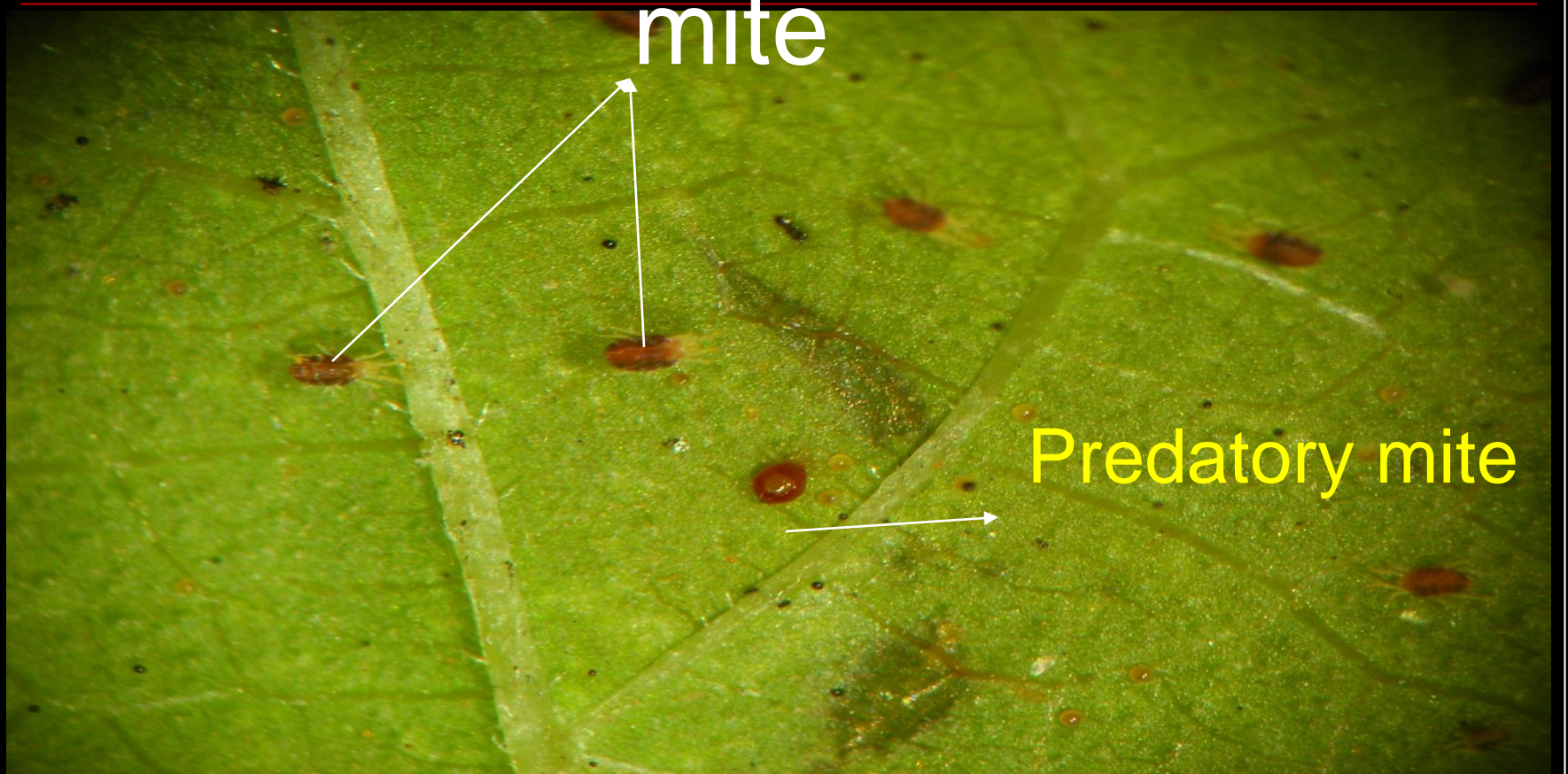
Predatory mite

spider

spider

กลุ่มแมลงทางการเกษตร

เรียบเรียงและจัดทำโดย กลุ่มงานชีววิธี ส่วนบริหารศัตรูพืช สำนักพัฒนาคุณภาพสินค้าเกษตร กรมส่งเสริมการเกษตร

Insect classification

- Classify to functional group.
- Functional group will specify duty in ecology.

- 3 groups: pest, natural enemy, neutral.

- Relation of 3 groups, affect to pest management decision.

ตารางจำแนกชนิดของแมลงตามลักษณะการดำรงชีวิต

Order	Plant feeder/pest	Natural enemy	neutral
ด้วง (Coleoptera)	/	/	/
แมลงหางดีด (Collembola)			/
แมลงหางหนีบ (Dermaptera)		/	
แมลงวัน,ยุง (Diptera)	/	/	/
ชีปะขาว (Ephemeroptera)			/
มวน (Hemiptera)	/	/	
เพลี้ย (Homoptera)	/		
ผึ้ง,ต่อ,แตน (Hymenoptera)		/	
ปลวก (Isoptera)			/
ผีเสื้อ (Lepidoptera)	/		
แมลงช้างปีกใส (Neuroptera)		/	
แมลงปอ (Odonota)		/	
ตั๊กแตน (Orthoptera)	/	/	
เพลี้ยไฟ (Thysanoptera)	/	/	

Information need	To control	To know
1. Scientific name (Genus-species) วงศ์ (Family) ตระกูล (Order)	✘	✔
2. Insect life cycle, shape	✔	✔
3. Morphology	✘	✔
4. Biochemistry	✘	✔
5. Biology	✘	✔
6. Environmental factor , host plant	✔	✘
7. Natural enemies	✔	✘
8. Factor effected infestation / restrain infestation	✔	✘

After insect pest and natural enemy classification, the other information need for pest control

- Symptom

- weather

- Plant health

- No.of pest and natural enemy (ratio of P:NE)

- Farmer practice

- Life cycle of pest

- Feeding behavior of insect