

**REPORT OF ATTACHMENT PROGRAM  
ON WEEVILS OF QUARANTINE  
IMPORTANCE WITH SPECIAL EMPHASIS  
ON STORED PRODUCT INSECT PESTS**

*7th November to 19th December 2018*

By

**KEMAS USMAN**  
(Indonesia)

Organized by:



Tokyo University of Agriculture  
(Tokyo NODAI), Japan

In Collaboration with:



ASEAN Network on Taxonomy

**2018**



Japan-ASEAN Cooperation



**Attachment Program:**  
**WEEVILS OF QUARANTINE IMPORTANCE WITH SPECIAL  
EMPHASIS ON STORED PRODUCT INSECT PESTS**

(JAIF Funded Project on Taxonomic Capacity Building to Support Market  
Access for Agricultural Trade in the ASEAN Region)

**Organizer:**

Tokyo University of Agriculture (NODAI), Japan

**Duration:**

7<sup>th</sup> November to 19<sup>th</sup> December 2018

**Participant Name & Position:**

**KEMAS USMAN**

(Plant Quarantine Officer - Indonesian Agricultural Quarantine Agency)

**Institutional Address & Country:**

**Indonesian Agricultural Quarantine Agency (IAQA),  
Ministry of Agriculture of the Republic of Indonesia**

E Building 5<sup>th</sup> Floor, Jl. Harsono RM No.3, Ragunan, Pasar Minggu,  
Jakarta Selatan 12550, INDONESIA

## TABLE OF CONTENTS

<b>1. Background Information</b>	2
<b>2. Objective of the Attachment</b>	2
<b>3. Program of the Attachment</b>	3
<b>4. Daily Activities</b>	6
<b>4.1 Tokyo University of Agriculture (NODAI) - Setagaya Campus</b>	6
<b>4.2 Yokohama Plant Protection Station</b>	7
<b>4.3 Kobe Plant Protection Station</b>	9
<b>4.4 Tsukuba</b>	11
<b>4.5 Tokyo University of Agriculture (NODAI) - Atsugi Campus</b>	12
<b>4.6 Other Activities</b>	16
<b>5. Summary of the Attachment</b>	16
<b>6. Recommendation for Future Activities</b>	17
<b>7. Acknowledgements</b>	17
<b>8. References</b>	18
<b>9. Annexes</b>	19
<b>10. Images/Photos</b>	77

## **1. BACKGROUND INFORMATION**

The ASEAN Plant Health Cooperation Network (APHCN) - ASEANET Project "Taxonomic capacity building to support market access for agricultural trade in the ASEAN region", funded by the Japan ASEAN Integration Fund (JAIF) successfully held its capacity building activity, entitled "Training Workshop on Diagnostics of Weevils of Quarantine Importance", from 10th to 22<sup>nd</sup> July 2017 at University of the Philippines Los Baños, Los Baños, Laguna, Philippines. This topic was chosen because this insect group are considered as pests of crops or stored products. Most of the small weevils can be present in imported agricultural and stored products. The damage that they cause is very destructive and can have an impact on economic aspect. On the other hand, there are many other species of weevils that attack agricultural crops. Hence, quick and accurate identification is vital in quarantine processes and converted farm areas. Based on the recommendation of the resource persons on the training, three selected participants are from Vietnam, Thailand, and Indonesia, which endorsed for the 2<sup>nd</sup> Phase of the Training. The theme of this attachment training program is "Weevils of Quarantine Importance with Special Emphasis on Stored Product Insect Pests".

The attachment program is a 1.5-month attachment training program organized by the ASEAN Plant Health Cooperation Network (APHCN) of ASEANET. The three participants will be trained to improve their diagnostic capability and enhance diagnostic resources in the ASEAN. This is also in line with the APHCN-ASEANET project "Taxonomic capacity building to support market access for agricultural trade in the ASEAN region". During the 1.5 month program, participants are attached in several laboratories in Japan, i.e. Tokyo University of Agriculture (NODAI) Setagaya and Atsugi campuses, and Tsukuba Post-entry Quarantine Centre & Yokohama Plant Protection Research Centre both under the Ministry of Agriculture, Forestry and Fisheries (MAFF). Through this attachment, the participants would be able to gain more in-depth knowledge on taxonomical identification of weevils of quarantine importance, to broaden their diagnostic capability, to increase competency to handle all pest diagnosis, and to widen their experience on weevil collection and preservation. The acquired information would be useful to build up the confidence and skills thus contributing to capacity development of each Institution or in the representative country of participant.

## **2. OBJECTIVES OF THE ATTACHMENT**

The objectives of the attachment program are:

- a. To transfer skills and knowledge of weevil experts specifically Japanese experts on Weevils to participants so as to increase capacity, experience, and knowledge of the participants in the diagnostics of pests and taxonomic identification and also will be able to learn techniques in identification;
- b. To strengthen the diagnostic capacity by providing participants with practical understanding of the concept of weevils, their identification and current management practices; and
- c. To tap these trained participants who would undergo more intensive technical training and subsequently serve as potential ASEAN resource persons on the identification of weevils using their gained expertise to the benefit of all ASEAN member states and the ASEAN Diagnostic Network.

### **3. PROGRAM OF THE ATTACHMENT**

The Attachment program is funded by the Japan ASEAN Integration Fund (JAIF) in cooperation with The ASEAN Plant Health Cooperation Network (APHCN) - ASEANET in Project "Taxonomic capacity building to support market access for agricultural trade in the ASEAN region" which organized by Tokyo University of Agriculture (NODAI). These program is continuation of the previous program that successfully held from 10<sup>th</sup> to 22<sup>nd</sup> July 2017 at Institute of Weed Science, Entomology and Plant Pathology, University of the Philippines Los Baños, Los Baños, Laguna, Philippines, entitled "Training Workshop on Diagnostics of Weevils of Quarantine Importance".

#### **Duration**

The attachment program was conducted start from 17 November to 19 december 2018 in Japan.

#### **Participants**

The attachment program consist of 3 (three) participants from: Thailand, Vietnam, and Indonesia, and also one training coordinator from ASEANET participated in the study visit. The participants were selected by the previous program entitled "Training Workshop on Diagnostics of Weevils of Quarantine Importance", from 10th to 22<sup>nd</sup> July 2017 at University of the Philippines Los Baños, Los Baños, Philippines, based on the recommendation of the resource persons on this program. All travel arrangements to Japan were coordinated by ASEANET and their costs in Japan (food & accommodation, etc.) paid for by JAIF project, after their approval, through ASEANET. The list of participants is given in the Attachment 1.

#### **Instructure/Facilitator**

The instructure or facilitator of the attachment are from: (1) Tokyo University of Agriculture (NODAI) - Setagaya Campus; (2) Yokohama Plant Protection Station; (3) Kobe Plant Protection Station; (4) Tsukuba Center of Yokohama Plant Protection Center; and (5) Tokyo University of Agriculture (NODAI) - Atsugi Campus. The list of instructure/facilitator is given in the Attachment 1.

#### **Program Activities**

The program of the attachment consist of 3 (three) activities, there are: lecture, laboratory practices, and field trip, and these divided into 5 (five) locations, there are: Tokyo University of Agriculture/NODAI - Setagaya Campus, Yokohama Plant Protection Station, Kobe Plant Protection Station, Tsukuba Center of Yokohama Plant Protection Station, and Tokyo University of Agriculture (NODAI) - Atsugi Campus. Table 1 shows the time tabel in each location.

Table 1 Time table of the attachment program in each location

Date	Location	Activities	Responsible Person/Scientist (s)
November 7, 2018 [Wednesday]	Narita Airport	Arrival in Tokyo	Staff of NODAI University
November 8, 2018 [Thursday]	NODAI (Setagaya)	Briefing and orientation	Prof. Natsuaki & Staff of NODAI University
November 9, 2018 [Friday]	Tokyo	Visit to Kagaku Mirai-kan Museum	Staff of NODAI University
November 10, 2018 [Saturday]	Tokyo	Visit to Tama Zoo (Insect Museum)	Staff of NODAI University
November 11, 2018 [Sunday]	Tokyo	Free day/Holiday	--
November 12, 2018 [Monday]	Move from Tokyo to Yokohama Plant Protection Station	<ul style="list-style-type: none"> <li>• Orientation</li> <li>• Dinner Party</li> </ul>	Yokohama Plant Protection Station
November 13, 2018 [Tuesday]	Yokohama Plant Protection Station	Lecture and Practice of Storage Pests (family of Coleoptera)	Yokohama Plant Protection Station
November 14, 2018 [Wednesday]	Yokohama Plant Protection Station	Lecture and Practice of Storage Pests (family Dermestidae)	Yokohama Plant Protection Station
November 15, 2018 [Thursday]	Yokohama Plant Protection Station	Lecture and Practice of Storage Pests (identification of larvae Lepidoptera)	Yokohama Plant Protection Station
November 16, 2018 [Friday]	Yokohama Plant Protection Station	Lecture and Practice of Storage Pests (identification of imago Lepidoptera)	Yokohama Plant Protection Station
November 17, 2018 [Saturday]	Yokohama	Free day/Holiday	--
November 18, 2018 [Sunday]	Move from Yokohama to Kobe Plant Protection Station	Free day/Holiday	--
November 19, 2018 [Monday]	Kobe Plant Protection Station	<ul style="list-style-type: none"> <li>• Greeting and orientation</li> <li>• Identification on stored beetles</li> </ul>	Kobe Plant Protection Station
November 20, 2018 [Tuesday]	Kobe Plant Protection Station	Visit to: <ul style="list-style-type: none"> <li>• Kamigumi Co., Ltd. in Port Island</li> <li>• Silo at Showa Sangyo Company</li> </ul>	Kobe Plant Protection Station
November 21, 2018 [Wednesday]	Kobe Plant Protection Station	<ul style="list-style-type: none"> <li>• Identification on stored beetles</li> <li>• Preparation of the presentation of training</li> </ul>	Kobe Plant Protection Station
November 22, 2018 [Thursday]	Kobe Plant Protection Station	<ul style="list-style-type: none"> <li>• Preparation of the presentation of training</li> </ul>	Kobe Plant Protection Station

		<ul style="list-style-type: none"> <li>• Presentation on the training</li> <li>• Wrap up session</li> </ul>	
November 23, 2018 [Friday]	Move from Kobe to Tokyo	Free day/Holiday [National day in Japan]	--
November 24, 2018 [Saturday]	Tokyo	<ul style="list-style-type: none"> <li>• Visit to Medicinal Plant Garden (Hoshi Pharmaceutical University)</li> <li>• Visit to Meguro Parasitological Museum</li> </ul>	Prof. Natsuaki & Staff of NODAI University
November 25, 2018 [Sunday]	Tokyo	Free day/Holiday	--
November 26, 2018 [Monday]	Move from Tokyo to Tsukuba	Visit to Tsukuba Agriculture Research Hall	Staff of NODAI University
November 27, 2018 [Tuesday]	Tsukuba	<ul style="list-style-type: none"> <li>• Tsukuba Center of Yokohama Plant Protection Station</li> <li>• Visit to Tsukuba Botanical Garden</li> </ul>	<ul style="list-style-type: none"> <li>• Tsukuba Center of Yokohama Plant Protection Station</li> <li>• Ms. Kaori Iwasawa (MAFF)</li> </ul>
November 28, 2018 [Wednesday]	Tsukuba	Visit to Food Entomology Laboratory, National Food Research Institute (NARO)	<ul style="list-style-type: none"> <li>• Dr. Akihiro Miyano-hista</li> <li>• Ms. Kaori Iwasawa (MAFF)</li> </ul>
November 29, 2018 [Thursday]	Tsukuba	Visit to Nissan Chemical Corporation	• Staff of Company
November 30, 2018 [Friday]	<ul style="list-style-type: none"> <li>• Move from Tsukuba to Yashio</li> <li>• Move from Yashio to Tokyo</li> </ul>	Visit to ANA Fresh Foods	<ul style="list-style-type: none"> <li>• Staff of ANA Fresh Foods</li> <li>• Prof. Natsuaki &amp; Staff of NODAI (Atsugi)</li> </ul>
December 1, 2018 [Saturday]	Tokyo	Free day/Holiday	--
December 2, 2018 [Sunday]	Move from Tokyo to Atsugi	Sightseeing of NODAI University-Atsugi Campus	Staff of NODAI (Atsugi)
December 3, 2018 [Monday]	NODAI (Atsugi)	Introduction of entomology laboratory and its facilities	Dr. Hiroaki Kojima & Staff of NODAI (Atsugi)
December 4, 2018 [Tuesday]	NODAI (Atsugi)	Lecture and practices of weevils systematic and classification	Dr. Hiroaki Kojima & Staff of NODAI (Atsugi)
December 5, 2018 [Wednesday]	NODAI (Atsugi)	Visit to pest control company (Fuji Flavour, Co. Ltd.)	<ul style="list-style-type: none"> <li>• Staff of Fuji Flavour, C. Ltd.</li> <li>• Staff of NODAI (Atsugi)</li> </ul>
December 6, 2018 [Thursday]	NODAI (Atsugi)	Lecture and practices of weevils systematic and classification	Dr. Hiroaki Kojima & Staff of NODAI (Atsugi)
December 7, 2018 [Friday]	NODAI (Atsugi)	Lecture and practices of weevils systematic and classification	Dr. Hiroaki Kojima & Staff of NODAI (Atsugi)

December 8, 2018 [Saturday]	Atsugi	Free day/Holiday	--
December 9, 2018 [Sunday]	Atsugi	Free day/Holiday	--
December 10, 2018 [Monday]	NODAI (Atsugi)	Listing storage pest insects in Japan	Dr. Hiroaki Kojima & Staff of NODAI (Atsugi)
December 11, 2018 [Tuesday]	NODAI (Atsugi)		Dr. Hiroaki Kojima & Staff of NODAI (Atsugi)
December 12, 2018 [Wednesday]	NODAI (Atsugi)	Visit to Kanagawa Prefecture Museum of Natural History	Staff of NODAI (Atsugi)
December 13, 2018 [Thursday]	NODAI (Atsugi)	Preparation presentation by participants	Dr. Hiroaki Kojima & Staff of NODAI (Atsugi)
December 14, 2018 [Friday]	NODAI (Atsugi)	Presentation by participants	Dr. Hiroaki Kojima & Staff NODAI (Atsugi)
December 15, 2018 [Saturday]	Move from Atsugi to Tokyo	Free day/Holiday	--
December 16, 2018 [Sunday]	Tokyo	Free day/Holiday	--
December 17, 2018 [Monday]	NODAI University (Setagaya)	<ul style="list-style-type: none"> <li>• Final Presentation</li> <li>• Farewell party</li> </ul>	All participants
December 18, 2018 [Tuesday]	Tokyo	Free day/Holiday	--
December 19, 2018 [Wednesday]	Departure of participants		

#### 4. DAILY ACTIVITIES

##### 4.1 Tokyo University of Agriculture (NODAI) - Setagaya

Tokyo University of Agriculture or NODAI is a private agriculture university. It was the first such institution founded in Japan. As of 2006 it is the only private university in Japan that specializes in agriculture. There are 3 (three) campus of NODAI, consists of: (1) Tokyo campus in Setagaya; (2) Atsugi Campus in Kanagawa; and (3) Okhotsk campus in Hokkaido. This Attachment Program conducted in 2 (two) locations, including: Tokyo campus in Setagaya and Atsugi Campus.

The activities carried out at the Tokyo campus in Setagaya consists of: (1) Introduction of NODAI and Plant Protection System in Japan (at the beginning of the attachment program); and (2) Final presentation (at the end of the attachment program). The activities was conducted during at NODAI - Setagaya can be seen in the Table 2 as follows.

Tabel 2 The activities at Tokyo University of Agriculture (NODAI) - Setagaya

No.	Activity	Result
1.	Briefing and orientation <b>Instructure:</b> <b>Prof. Keiko Natsuaki (NODAI)</b> Date: 8 November 2018	Presentation and introduction of: <ul style="list-style-type: none"> <li>• Tokyo University of Agriculture (NODAI),</li> <li>• Plant Protection System in Japan,</li> <li>• Agriculture of Japan in current time.</li> </ul>

2.	Orientation of Tokyo University of Agriculture (NODAI) - Setagaya Campus <b>Instructure:</b> <b>Staff of NODAI</b> Date: 8 November 2018	Orientation of: <ul style="list-style-type: none"> <li>• Laboratorium,</li> <li>• Building,</li> <li>• Library,</li> <li>• Education system,</li> <li>• Other facilities,</li> <li>• etc.</li> </ul>
3.	Visit to Kagaku Mirai-kan Museum <b>Guide:</b> <b>Staff of NODAI</b> Date: 9 November 2018	<ul style="list-style-type: none"> <li>• Kagaku Mirai-kan Museum is museum or research facility dedicated to inspiring discovery about the science and technology through its exhibitions and education programs.</li> <li>• Participants had the opportunity to get information related to the technological progress of today, from simple day-to-day questions, to the latest technologies, the global environment, space exploration and life science, etc.</li> </ul>
4.	Visit to Tama Zoological Park (Insect Museum) <b>Guide:</b> <b>Staff of NODAI</b> Date: 10 November 2018	<ul style="list-style-type: none"> <li>• Tama Zoological Park is a unique zoological park, where animals are displayed under naturalistic and spectacular habitats set up in its vast land of 52 ha (129 acres). The zoo has three ecological areas, i.e., the Asiatic Garden, African Garden and Australian Garden, and the Insectarium.</li> <li>• Participants got more information about the collections of the zoo, including: domestic and exotic animal, including insect collections in Insectarium.</li> </ul>
5.	Final presentation <b>Date:</b> <b>17 December 2018</b>	<p>Presentation of final report by participants from:</p> <ul style="list-style-type: none"> <li>• Thailand,</li> <li>• Vietnam, and</li> <li>• Indonesia.</li> </ul> <p>The content of presentation, consists of: background, objectives, activities, conclusion of the attachment program.</p>

## 4.2 Yokohama Plant Protection Station

Plant Protection System in Japan perform import inspections for plants to prevent the entry of harmful pests from overseas into Japan, and export inspections based on plant quarantine requirements specified by destination countries in order to prevent similar problems abroad. Plant Protection Organization in Japan consists of 5 (five) Head Office, there are: (1) Yokohama Plant Protection; (2) Kobe Plant Protection; (3) Nagoya Plant Protection; (4) Moji Plant Protection; and (5) Naha Plant Protection. This Attachment Program conducted in 2 (two) locations, there are: Yokohama Plant Protection (including Tsukuba Center of Yokohama Plant Protection Station) and Kobe Plant Protection.

Generally, the daily activities carried out at the Yokohama Plant Protection Station consists of: (1) Introduction of Plant Protection System in Japan and orientation of Yokohama Plant Protection Station; (2) Sightseeing storage pest specimen collections; and (3) Lecture and practice identification of storage pests

in the laboratory. The activities was conducted during at Yokohama Plant Protection Station can be seen in the Table 3 as follows.

Tabel 3 The activities at at Yokohama Plant Protection Station

No.	Activity	Result
1.	Briefing and orientation <b>Instructure (Yokohama Plant Protection Station):</b> <b>1. Mr. Yukio Yokoi</b> <b>2. Mr. Ren Iwaizumi</b> Date: 12 November 2018	Briefing and orientation divided into: 1. Presentation of: <ul style="list-style-type: none"> <li>• Plant protection system in Japan,</li> <li>• International/regional arrangements and Japan's contributions</li> </ul> 2. Introduction of Yokohama Plant Protection Station (structure of organization, facilities, human resources, laboratorium, management, etc.)
2.	Sightseeing storage pest specimen collections <b>Instructure:</b> <b>Mr. Yamaguchi</b> <b>(Yokohama Plant Protection Station)</b> Date: 12 November 2018	Participants received information of storage pest specimen collection at Yokohama Plant Protection Station. This collection was collected by the interception at the port.
3.	Lecture and Practice of Storage Pests: Identification of some families in Coleoptera (as a storage pests) by morphological characters using identification key <b>Instructure:</b> <b>Mr. Matsumoto</b> <b>(Yokohama Plant Protection Station)</b> Date: 13 November 2018	There are some identified families, consists of: <ul style="list-style-type: none"> <li>• Super Family Bostrychoidea:               <ul style="list-style-type: none"> <li>- Anobiidae</li> <li>- Bostrichidae</li> <li>- Ptinidae</li> </ul> </li> <li>• Super Family Cleroidea:               <ul style="list-style-type: none"> <li>- Cleridae</li> <li>- Trogossitidae</li> </ul> </li> <li>• Super Family Chrysomeloidea:               <ul style="list-style-type: none"> <li>- Bruchidae</li> </ul> </li> <li>• Super Family Curculionoidea:               <ul style="list-style-type: none"> <li>- Anthribidae</li> <li>- Dryophthoridae</li> </ul> </li> <li>• Super Family Cucujoidea:               <ul style="list-style-type: none"> <li>- Cerylonidae</li> <li>- Lathriididae</li> <li>- Silvanidae</li> <li>- Tenebrionidae</li> </ul> </li> <li>• Super Family Dermestoidea:               <ul style="list-style-type: none"> <li>- Dermestidae</li> </ul> </li> </ul>
3.	Lecture and Practice of Storage Pests: Identification of some species in Dermestidae (as a storage pests) by morphological characters using identification key <b>Instructure:</b> <b>Mr. Matsumoto</b> <b>(Yokohama Plant Protection Station)</b> Date: 14 November 2018	There are some identified species, consists of: <ul style="list-style-type: none"> <li>• <i>Anthrenus verbasci</i>,</li> <li>• <i>Attagenus</i> sp.,</li> <li>• <i>Dermestes ater</i>,</li> <li>• <i>Dermestes frischii</i>,</li> <li>• <i>Dermestes haemorrhoidalis</i>,</li> <li>• <i>Dermestes maculatus</i>,</li> <li>• <i>Trogoderma glabrum</i>,</li> <li>• <i>Trogoderma granarium</i>,</li> <li>• <i>Trogoderma variabile</i>, and</li> <li>• <i>Trogoderma varium</i>.</li> </ul>

4.	<p>Lecture and Practice of Storage Pests:  Identification of larvae Lepidoptera (as a storage pests) by morphological characters using identification key</p> <p><b>Instructure:</b>  <b>Mr. Higo Yuichi</b>  <b>(Yokohama Plant Protection Station)</b>  Date:  15 November 2018</p>	<p>Lecture and practice scopes consists of:</p> <ol style="list-style-type: none"> <li>1. Basic knowledge regarding morphological characteristics of larvae Lepidoptera; and</li> <li>2. Identification of larva Lepidoptera (as storage pests).</li> </ol> <p><b>Basic knowledge of morphological characters</b>  There are some identified specimens of larvae Lepidoptera, consists of:</p> <ul style="list-style-type: none"> <li>• <i>Helicoverpa armigera</i> (Lepidoptera: Noctuidae),</li> <li>• Larvae of family Heliiothinae, and</li> <li>• <i>Carposina sasakii</i> (Lepidoptera: Carposinidae).</li> </ul> <p><b>Identification of larva Lepidoptera (as storage pests)</b>  There are some identified species of larvae Lepidoptera, consists of:</p> <ul style="list-style-type: none"> <li>• <i>Plodia interpunctela</i>,</li> <li>• <i>Corcyra cephalonica</i>,</li> <li>• <i>Cadra cautella</i>,</li> <li>• <i>Cydia pomonella</i>,</li> <li>• <i>Ephestia kuehniella</i>,</li> <li>• <i>Pyralis farinalis</i>,</li> <li>• <i>Sitotroga cerealella</i>,</li> <li>• <i>Paralipsa gularis</i>, and</li> <li>• <i>Helicoverpa armigera</i>.</li> </ul>
5.	<p>Lecture and Practice of Storage Pests:  Identification of Imago Lepidoptera (as a storage pests) by morphological characters using identification key</p> <p><b>Instructure:</b>  <b>Mr. Higo Yuichi</b>  <b>(Yokohama Plant Protection Station)</b>  Date:  16 November 2018</p>	<p>Lecture and practice scopes consists of:</p> <ol style="list-style-type: none"> <li>1. Basic knowledge regarding morphological characteristics of imago Lepidoptera; and</li> <li>2. Identification of imago Lepidoptera (as storage pests) by genitalia characters.</li> </ol> <p><b>Basic knowledge of morphological characters</b>  There are some identified specimens of imago Lepidoptera, consists of:</p> <ul style="list-style-type: none"> <li>• <i>Helicoverpa armigera</i> (Lepidoptera: Noctuidae) male and female, and</li> <li>• <i>Spodoptera litura</i> (Lepidoptera: Noctuidae) male and female.</li> </ul> <p><b>Identification of imago Lepidoptera (as storage pests) by genitalia characters</b>  There are some identified species of larvae Lepidoptera, consists of:</p> <ul style="list-style-type: none"> <li>• <i>Corcyra cephalonica</i> (male and female),</li> <li>• <i>Plodia interpunctella</i> (male and female),</li> <li>• <i>Sitotroga cerealella</i> (male and female), and</li> <li>• <i>Ephestia kuehniella</i> (male and female).</li> </ul>

#### 4.3 Kobe Plant Protection Station

Generally, the daily activities carried out at the Kobe Plant Protection Station consists of: (1) Briefing and orientation of Kobe Plant Protection Station;

(2) Lecture and practice identification of storage pests in the laboratory; (3) Visit to quarantine work fields; and (4) Presentation of result training in Yokohama and Kobe Plant Protection Station. The activities was conducted at Kobe Plant Protection Station can be seen in the Table 4 as follows.

Table 4 The activities at Kobe Plant Protection Station

No.	Activity	Result
1.	Briefing and orientation <b>Instructure:</b> <b>Mr. Tatsuo Matsuda (Kobe Plant Protection Station)</b> Date: 19 November 2018	Briefing and orientation divided into: 1. Presentation of: <ul style="list-style-type: none"> <li>• Overview of Ministry of Agriculture, Forestry and Fisheries - Kobe Plant Protection Station (structure of organization, inspection areas in Kobe Port, and plant quarantine procedures)</li> </ul> 2. Introduction of Kobe Plant Protection Station (structure of organization, facilities, human resources, laboratorum, management, etc.)
2.	Lecture and Practice of Storage Pests: Identification of Darkling Beetles <b>Instructure:</b> <b>Mr. Tatsuo Matsuda (Kobe Plant Protection Station)</b> Date: 19 November 2018	There are some identified species, consists of: <ul style="list-style-type: none"> <li>• <i>Alphitophagus bifasciatus</i>,</li> <li>• <i>Tribolium confusum</i>,</li> <li>• <i>Tribolium destructor</i>,</li> <li>• <i>Tribolium castaneum</i>,</li> <li>• <i>Tribolium madens</i>,</li> <li>• <i>Tenebrio molitor</i>,</li> <li>• <i>Tenebrio obscurus</i>,</li> <li>• <i>Palembus dermestoides</i>,</li> <li>• <i>Alphitobius diaperinus</i>,</li> <li>• <i>Alphitobius laevigatus</i>,</li> <li>• <i>Palorus ratzeburgi</i>, and</li> <li>• <i>Palorus cerylonoides</i>.</li> </ul>
3.	Lecture and Practice of Storage Pests: Identification of Darkling Beetles and Seed Beetles <b>Instructure:</b> <b>Mr. Tatsuo Matsuda (Kobe Plant Protection Station)</b> Date: 20 November 2018	There are some identified species, consists of: <b>Darkling Beetles</b> <ul style="list-style-type: none"> <li>• <i>Gnathocerus cornutus</i>,</li> <li>• <i>Gnathocerus maxillosus</i>, and</li> <li>• <i>Latheticus oryzae</i>.</li> </ul> <b>Seed Beetles</b> <ul style="list-style-type: none"> <li>• <i>Caryedon serratus</i>, and</li> <li>• <i>Zabrotes subfasciatus</i>.</li> </ul>
4.	Field visit to Visit to Kamigumi Co., Ltd. In Port Island <b>Instructure:</b> <b>Mr. Tatsuo Matsuda &amp; Staff of Kobe Plant Protection Station</b> Date: 20 November 2018	<ul style="list-style-type: none"> <li>• Kamigumi Co., Ltd. is company that was at the outset engaged in port cargo unloading and transportation, Kamigumi steadily expanded its field of operations to include such activities as warehouse storage, overland transport and heavy cargo transportation.</li> <li>• Kamigumi Co., Ltd. have some divisions, including Vegetable &amp; Fruits Division which handling vegetable and fruits importation from trading partner countries, for example banana from Philippines, kiwi from New Zealand, etc.</li> </ul>

		<ul style="list-style-type: none"> <li>Participants had the opportunity to see quarantine officers inspect the banana fruits imported from Philippines and kiwi fruits from New Zealand, especially to detect storage product insects.</li> </ul>
5.	Field visit to Visit to Silo at Showa Sangyo Company <b>Instructure:</b> <b>Mr. Tatsuo Matsuda &amp; Staff of Kobe Plant Protection Station</b> Date: 20 November 2018	<ul style="list-style-type: none"> <li>Showa Sangyo Company is company that have some business scopes, there are: household foods, animal feed, flour milling, etc.</li> <li>There are 4 (four) main grain commodities which handle by this company: rice, soybean, wheat, and canola.</li> <li>Participants had the opportunity to see silo area and get an information of how the quarantine officer works to take samples in the field, especially to detect storage product insects.</li> </ul>
6.	Lecture and Practice of Storage Pests: <b>Identification of Seed Beetles</b>  <b>Instructure:</b> <b>Mr. Tatsuo Matsuda (Kobe Plant Protection Station)</b> Date: 21 November 2018	There are some identified species, consists of: <ul style="list-style-type: none"> <li><i>Acanthoscelides obtectus</i>,</li> <li><i>Bruchus pisorum</i>,</li> <li><i>Callosobruchus chinensis</i>, and</li> <li><i>Callosobruchus maculatus</i>.</li> </ul>

#### 4.4 Tsukuba

The activities also carried out at the Tsukuba, consists of: (1) Visit to Tsukuba Agriculture Research Hall; (2) Orientation of Tsukuba Center of Yokohama Plant Protection Station Laboratories; (3) Visit to Tsukuba Botanical Garden; (4) Orientation of Food Entomology Laboratory in NARO; (5) Orientation of Entomology Laboratory in Nissan Chemical Company; and (6) Visit to ANA Fresh Food Company. The activities was conducted during the training at Tsukuba can be seen in the Table 5 as follows.

Tabel 5 Laboratory studies during the training at Tsukuba

No.	Activity	Result
1.	Visit to Tsukuba Agriculture Research Hall <b>Guide:</b> <ul style="list-style-type: none"> <li>Staff of Tsukuba Agriculture Research Hall</li> <li>Staff of NODAI</li> </ul> Date: 26 November 2018	<ul style="list-style-type: none"> <li>Tsukuba Agriculture Research Hall showcases the research work in agriculture, forestry and fisheries that is carried out by National Research and Development Agency, uncluding the National Agriculture and Food Research Organization (NARO).</li> <li>Participants got more information about the importance of food and agricultural research in Japan through exhibition panels illustrate and also display of the many tools that have been used during the history of Japanese agriculture.</li> </ul>
2.	Orientation of Tsukuba Center of Yokohama Plant Protection Station Laboratories	Orientation divided into: 1. Presentation of: <ul style="list-style-type: none"> <li>Overview of Tsukuba Center of</li> </ul>

	<b>Instructure (Yokohama Plant Protection Station Laboratories):</b> <b>Mr. Shuichi Uchiyama</b> Date: 27 November 2018	Yokohama Plant Protection, and <ul style="list-style-type: none"> <li>• Post entry quarantine activities</li> </ul> 2. Sightseeing post entry quarantine facilities (laboratories, green house, etc.).
3.	Visit to Tsukuba Botanical Garden <b>Guide:</b> <b>Ms. Kaori Iwasawa (Plant Protection Division, MAFF)</b> Date: 27 November 2018	<ul style="list-style-type: none"> <li>• Tsukuba Botanical Garden is major botanical garden broadly about 14 hectares located in Tsukuba, Ibaraki Prefecture in Japan. As a research branch of the National Museum of Nature and Science, the garden is one of Japan's foremost botanical research facilities and provides public education. It currently contains of domestic and exotic plants from temperate and tropical regions around the world.</li> <li>• Participants got more information about the collections of the garden, including: domestic and exotic plants, temperate coniferous, warm-temperate deciduous broad-leaved, cool-temperate deciduous broad-leaved, aquatic plants, etc.</li> </ul>
4.	Orientation of Food Entomology Laboratory in NARO <b>Instructure (Food Entomology Laboratory in NARO):</b> <b>Dr. Akihiro Miyano-hista</b> Date: 28 November 2018	Orientation divided into: <ol style="list-style-type: none"> <li>1. Overview of National Agricultural and Food Research Organization (NARO) especially Food Entomology Unit on Division of Food Safety, and</li> <li>2. Sightseeing Food Entomology Unit on Division of Food Safety facilities (laboratories).</li> </ol>
5.	Orientation of Entomology Laboratory in Nissan Chemical Company <b>Guide:</b> <ul style="list-style-type: none"> <li>• Staff of the company</li> <li>• Staff of NODAI</li> </ul> Date: 29 November 2018	Orientation divided into: <ol style="list-style-type: none"> <li>1. Presentation of overview of Nissan Chemical Company, and</li> <li>2. Sightseeing laboratories, green house, experiments field, etc.</li> </ol>
6.	Visit to ANA Fresh Food Company <b>Guide:</b> <ul style="list-style-type: none"> <li>• Prof. Keiko Natsuaki (NODAI)</li> <li>• Staff of ANA Fresh Food Company</li> </ul> Date: 30 November 2018	<ul style="list-style-type: none"> <li>• ANA Fresh Food Company is company that have some business scopes, there are: fresh food business, processed food, food export, etc. The main imported fruits which handle by this company: bananas from the Philippines and bananas from Ecuador.</li> <li>• Participants had the opportunity to see the processing of fresh banana including ripening step and packaging.</li> </ul>

#### 4.5 Tokyo University of Agriculture (NODAI) - Atsugi Campus

During the training at the Tokyo University of Agriculture (NODAI) - Atsugi Campus, participants have some daily activities carried out, consists of: (1) Orientation of Tokyo University of Agriculture (NODAI) - Atsugi Campus; (2) Sightseeing insect pest specimen collections; (3) Lecture and practice identification of storage pests in the laboratory; and (4) Presentation of the result

training at the Atsugi. The activities was conducted during at Tokyo University of Agriculture (NODAI) - Atsugi Campus can be seen in the Table 6 as follows.

Tabel 6 The activities at Tokyo University of Agriculture (NODAI) - Atsugi

No.	Activity	Result
1.	Introduction of entomology laboratory and its facilities <b>Instructure (NODAI):</b> <b>1. Hiroaki Kojima, Ph.D.</b> <b>2. Tadashi Ishikawa, Ph.D.</b> Date: 3 December 2018	<ul style="list-style-type: none"> <li>• Participants got more information of Laboratory Entomology at Tokyo University of Agriculture (NODAI) - Atsugi Campus.</li> <li>• Participants also have a good references related to the laboratory facilities in Tokyo University of Agriculture (NODAI) - Atsugi Campus, such as: room, tools, Scanning Electron Microscope (SEM), book/journals collections related to storage pest insects, etc.</li> </ul>
2.	Introduction insect pest specimen collections <b>Instructure:</b> <b>Hiroaki Kojima, Ph.D. (NODAI)</b> Date: 3 December 2018	Participants received information of insect pest specimen collection at Tokyo University of Agriculture (NODAI) - Atsugi Campus. This collection was collected from some activities: survey in the field, interception at the port, etc.
3.	Lecture and practices of weevils systematic and classification: Identification of some families and sub families in Coleoptera (as a storage pests and field pests) by morphological characters using identification key <b>Instructure:</b> <b>Hiroaki Kojima, Ph.D. (NODAI)</b> Date: 4 December 2018	Participants practices to identify some insect specimens from Borneo Island. There are some identified weevils insects, consists of: <ul style="list-style-type: none"> <li>• Family anthribidae</li> <li>• Family Attelabidae</li> <li>• Family Rynchytidae</li> <li>• Family Dryophthoridae</li> <li>• Family Apionidae</li> <li>• Family Nanophyidae</li> <li>• Family Brachyceridae</li> <li>• Family Curculionidae:               <ul style="list-style-type: none"> <li>- Sub Family Entiminae</li> <li>- Sub Family Orbitidinae</li> <li>- Sub Family Ceutorhynchinae</li> <li>- Sub Family Curculioninae</li> <li>- Sub Family Conoderinae</li> <li>- Sub Family Baridinae</li> <li>- Sub Family Lixinae</li> <li>- Sub Family Cossoninae</li> <li>- Sub Family Erihinae</li> <li>- Sub Family Molytinae</li> <li>- Sub Family Cryptorhynchinae</li> </ul> </li> </ul>
4.	Visit to pest control company (Fuji Flavour, Co. Ltd.) <b>Guide:</b> <b>Staff of Fuji Flavour, Co., Ltd.</b> Date: 5 December 2018	<ul style="list-style-type: none"> <li>• Fuji Flavour, Co. Ltd. is company that have 2 (two) main business scopes, there are: flavor development and insect pest monitoring (Ecomone).</li> <li>• There are some products of this company which function in monitoring of stored product insects and agricultural insects, such as: New Serrico, Gachon, and Torios.</li> <li>• Participants had the opportunity to get information related to company profile</li> </ul>

		<p>including its products, manufacturing line, research and development are, etc.</p> <ul style="list-style-type: none"> <li>• Participants also presented the material related to introduction and summary of the attachment program (background of training, theme, focus on weevils storage pests, etc.)</li> <li>• There are some discussion between the participants and the company.</li> </ul>
5.	<p>Lecture and practices of weevils systematic and classification: Identification of some families and sub families in Coleoptera (as a storage pests and field pests) by morphological characters using identification key</p> <p><b>Instructure:</b> <b>Hiroaki Kojima, Ph.D.</b> (NODAI) Date: 6 December 2018</p>	<p>Participants practices to identify some insect specimens from Borneo Island. There are some identified weevils insects, consists of:</p> <ul style="list-style-type: none"> <li>• Family anthribidae</li> <li>• Family Attelabidae</li> <li>• Family Rynchytidae</li> <li>• Family Dryophthoridae</li> <li>• Family Apionidae</li> <li>• Family Nanophyidae</li> <li>• Family Brachyceridae</li> <li>• Family Curculionidae: <ul style="list-style-type: none"> <li>- Sub Family Entiminae</li> <li>- Sub Family Orobittidae</li> <li>- Sub Family Ceutorhynchinae</li> <li>- Sub Family Curculioninae</li> <li>- Sub Family Conoderinae</li> <li>- Sub Family Baridinae</li> <li>- Sub Family Lixinae</li> <li>- Sub Family Cossoninae</li> <li>- Sub Family Erihinae</li> <li>- Sub Family Molytinae</li> <li>- Sub Family Cryptorhynchinae</li> </ul> </li> </ul>
6.	<p>Lecture and practices of weevils systematic and classification: Identification of some families and sub families in Coleoptera (as a storage pests and field pests) by morphological characters using identification key</p> <p><b>Instructure:</b> <b>Hiroaki Kojima, Ph.D.</b> (NODAI) Date: 7 December 2018</p>	<p>Participants practices to identify some insect specimens from Borneo Island. There are some identified weevils insects, consists of:</p> <ul style="list-style-type: none"> <li>• Family anthribidae</li> <li>• Family Attelabidae</li> <li>• Family Rynchytidae</li> <li>• Family Dryophthoridae</li> <li>• Family Apionidae</li> <li>• Family Nanophyidae</li> <li>• Family Brachyceridae</li> <li>• Family Curculionidae: <ul style="list-style-type: none"> <li>- Sub Family Entiminae</li> <li>- Sub Family Orobittidae</li> <li>- Sub Family Ceutorhynchinae</li> <li>- Sub Family Curculioninae</li> <li>- Sub Family Conoderinae</li> <li>- Sub Family Baridinae</li> <li>- Sub Family Lixinae</li> <li>- Sub Family Cossoninae</li> <li>- Sub Family Erihinae</li> <li>- Sub Family Molytinae</li> <li>- Sub Family Cryptorhynchinae</li> </ul> </li> </ul>
7.	<p>Listing of storage product insects in Japan</p>	<ul style="list-style-type: none"> <li>• Participants had the opportunity to get information related to list of storage</li> </ul>

	<p><b>Instructure:</b>  <b>Hiroaki Kojima, Ph.D.</b>  (NODAI)  Date:  10 December 2018</p>	<p>product pest in Japan.</p> <ul style="list-style-type: none"> <li>• The data sources used is: <ul style="list-style-type: none"> <li>- Agricultural Insect Pest in Japan [Kenji Umeya, Toshitsugu Okada, Eds.], and</li> <li>- Major Insect and Other Pests of Economic Plants in Japan [The Japanese Society of Applied Entomology and Zoology].</li> </ul> </li> </ul>
8.	<p>Lecture and practices of weevils systematic and classification: Identification of some families and sub families in Coleoptera (as a storage pests and field pests) by morphological characters using identification key</p> <p><b>Instructure:</b>  <b>Hiroaki Kojima, Ph.D.</b>  (NODAI)  Date:  11 December 2018</p>	<p>Participants practices to identify some insect specimens from Vietnam. There are some identified weevils insects, consists of:</p> <ul style="list-style-type: none"> <li>• Family anthribidae</li> <li>• Family Attelabidae</li> <li>• Family Rynchytidae</li> <li>• Family Dryophthoridae</li> <li>• Family Apionidae</li> <li>• Family Nanophyidae</li> <li>• Family Brentidae</li> <li>• Family Brachyceridae</li> <li>• Family Curculionidae: <ul style="list-style-type: none"> <li>- Sub Family Entiminae</li> <li>- Sub Family Orobitidinae</li> <li>- Sub Family Ceutorhynchinae</li> <li>- Sub Family Curculioninae</li> <li>- Sub Family Conoderinae</li> <li>- Sub Family Baridinae</li> <li>- Sub Family Lixinae</li> <li>- Sub Family Cossoninae</li> <li>- Sub Family Erihinae</li> <li>- Sub Family Molytinae</li> <li>- Sub Family Cryptorhynchinae</li> </ul> </li> </ul>
9.	<p>Visit to Kanagawa Prefectural Museum of Natural History</p> <p><b>Guide:</b>  <b>Staff of NODAI</b>  Date:  12 December 2018</p>	<ul style="list-style-type: none"> <li>• Kanagawa Prefectural Museum of Natural History is museum or research facility dedicated to inspiring discovery about the natural world through its exhibitions and education programs.</li> <li>• Participants had the opportunity to get information related to collections about the formation of solar system, history of the Earth, evolution of life, biodiversity, insect specimens, flora and fauna, etc.</li> </ul>
10.	<p>Preparation of presentation on training in Atsugi</p> <p>Date:  13 December 2018</p>	<p>Participants had prepare the presentation material in powerpoint.</p>
11.	<p>Presentation on training in Atsugi</p> <p>Date:  14 December 2018</p>	<ul style="list-style-type: none"> <li>• Participants had opportunity to convey the presentation material in powerpoint.</li> <li>• The material of presentation consist of: <ul style="list-style-type: none"> <li>- Introduction of participants</li> <li>- Summary of training in Atsugi</li> </ul> </li> <li>• This agenda attended by the Staff of NODAI at Atsugi Campus.</li> <li>• There some discussion between the participants and Staff of Atsugi Campus related to training material.</li> </ul>

## 4.6 Other Activities

In addition to daily activities carried out on weekdays, participants also get the opportunity to do activities on weekends. The objectives of this activities is to increase the knowledge of the participants regarding to the science and technology development in Japan and indirectly introduce culture and tourism in Japan. The other activities was conducted during the training can be seen in the Table 7 as follows.

Table 7 Other activities

No.	Activity	Result
1.	Visit to Medicinal Plant Garden attached to Hoshi Pharmaceutical University <b>Instructure:</b> <b>Prof. Natsuaki (NODAI University)</b> Date: 24 November 2018	<ul style="list-style-type: none"> <li>Hoshi University is a private university in Shinagawa, Tokyo, Japan, specializing in pharmaceutical sciences.</li> <li>In this opportunity, participants get an opportunity to visit medicinal plant garden in the university and have a lot information about the collection of plants (tropical and sub tropical plants).</li> <li>In this filed visit, participants also observe some of insect pests that attack the medicinal plants.</li> </ul>
2.	Visit to Meguro Parasitological Museum <b>Instructure:</b> <b>Prof. Natsuaki (NODAI University)</b> Date: 24 November 2018	<ul style="list-style-type: none"> <li>Meguro Parasitological Museum is a small medical museum in the Meguro Ward in central Tokyo, Japan. The museum is devoted to parasites and the science of parasitology.</li> <li>In this opportunity, participants get a lot information about the collection of parasites including kind of parasites (nematodes, insects, etc.) and its impact to animal and human through the exhibition and displays.</li> </ul>
3.	Other activities: <ul style="list-style-type: none"> <li>Travelling around Tokyo City (Shinjuku, Shibuya, Ueno, Meiji Jingu, Senso-ji),</li> <li>Take a cruise around Yokohama bay,</li> <li>Visit to Sankeien Garden at Yokohama,</li> <li>Visit to Kobe Port Tower,</li> <li>Etc.</li> </ul>	Through these activities, participants got a lot of knowledge regarding to the science and technology development in Japan and indirectly introduce culture and tourism in Japan.

## 5. SUMMARY OF THE ATTACHMENT

In general, the attachment program was well implemented in each location. The attachment program consist of some activities, such as laboratory studies, insect specimen collection studies, field studies, and other activities. There are some of the benefits obtained by the Participants during the attachment program as follows:

- Participants got a lot information's related to skills and knowledge of weevil identification by the Japanese experts. Through these training, participants also have the strengthening of the diagnostic capacity by practical

understanding of the concept of weevils, their identification and current management practices.

- During the activities in the laboratory (in the universities and Plant Protection Station), participants gained knowledge in identifying of weevil storage insect pests to the sub-family level based on the morphological characteristics using an dycotomous key which is very useful in the quarantine task. This experiences could be increase capacity of the participants in the diagnostics of weevils and storage pests and also will be able to learn techniques in identification;
- In addition to the stereo microscope, participants gained knowledge and experience in using identification equipment such as Stereo Electron Microscope (SEM);
- Based on the insect specimen learning activities, participants got information related to:
  - various insects species that are native in Japan are mostly obtained from the surveillance, and also quarantine pest insects are mostly obtained from from the interception;
  - specimen collection methods commonly used in Japan including techniques for making specimen collections, collection boxes, specimen needles, preservatives, temperature and humidity settings, etc.
- Participants got the information of control methods of weevils storage insect pests are common developed in Japan. Through these training, participants also have the strengthening by practical understanding of the concept of weevils, their identification and current management practices;
- Participants got the information related to plant protection system in Japan, there are: organizational structure, technical division, function, policy, etc., which can be a good reference for plant quarantine in Indonesia;
- Participants have knowledge and experience regarding the implementation of plant quarantine tasks in general, such as: inspection in the field and laboratories, sampling at the port, silos, etc.
- Participants got the information related to bio-based companies, there are:
  - Pesticides and herbicides are developed in Japan;
  - Feromones for insect monitoring;
  - Ripening method of fresh fruit, such as banana;
  - Etc.
- Participants also have an opportunity to build up the networking with the weevil's experts in Japan and with other Parties who involved in these attachment program.

## **6. RECOMMENDATION FOR FUTURE ACTIVITIES**

Base on the implementation of these attachment program with the theme "Weevils of Quarantine Importance with Special Emphasis on Stored Product Insect Pests", It would be more beneficial if the participants were given the skills to identify weevil pests until genus or species level, so it would be more useful for participants to develop it in their country. Besides that, sampling activity would be a good activity during the filed visit. Sampling activity can be implemented in the plantation field or plant quarantine are at the sea port or air port.

## **7. ACKNOWLEDGEMENTS**

I would like to acknowledge and extend my gratitude thank to Japan ASEAN Integration Fund (JAIF) for the financial support to this program. I would

like to thanks ASEANET and Dr. Soetikno S. Sastroutomo for his help and his arrangement of the training. We sincere gratitude to Prof. Keiko Natsuaki, Dr. Hiroaki Kojima, Dr. Tadashi Ishikawa, and the students (Tokyo University of Agriculture - NODAI), Mr. Yukio Yokoi, Mr. Ren Iwaizumi, Mr. Tatsuo Matsuda, and Ms. Kaori Iwasawa (Plant Protection - Ministry of Agriculture, Forestry and Fisheries) for providing their valuable time and cooperation, and without their help this training program would not have been easy to prepare. I also would like to thanks Mrs. Banun Harpini, Dr. Antarjo Dikin, and Dr. Arifin Tasrif (Indonesian Agricultural Quarantine Agency) for their support. Moreover, I also thankful to Mr. Ittipon Bannakan and Dr. Hoang Kim Thoa (Participant) for our work hard and cooperation during attending lectures, discussions, laboratory, field visit, and for the great experiences in this training.

## 8. REFERENCES

- <https://www.ana-foods.co.jp/en/>. ANA Fresh Food: Business.
- <https://www.fjf.co.jp/>. Fuji Flavour, C. Ltd.: Company Profile.
- <http://www.miraikan.jst.go.jp/>. Miraikan: National Museum of Emerging Science and Innovation.
- <http://www.naro.affrc.go.jp/>. Food Research Institute of NARO.
- <http://nh.kanagawa-museum.jp/>. Kanagawa Prefectural Museum of Natural History.
- <https://www.kiseichu.org/>. Meguro Parasitological Museum.
- <https://www.nissanchem.co.jp/eng/products/>. Business and Products.
- <http://www.tbg.kahaku.go.jp/english/>. Tsukuba Botanical Garden.
- <https://www.tokyo-zoo.net/english/tama/>. Tama Zoological Park.
- Kingsolver JM. 1991. Adult beetles (Coleoptera). *Insect and Mite Pests in Food USDA 1*: 77-93.
- Kingsolver JM. 1991. Dermestid beetles (Coleoptera). *Insect and Mite Pests in Food USDA 1*: 115-126.
- Kuschel G. 1995. A phylogenetic classification of Curculionoidea to families and subfamilies. *Memoir Entomol* 14: 5-33.
- Morimoto K, H. Kojima, and S. Miyakawa. 2006. *The Insects of Japan, Volume 3: Curculionoidea: General Introduction and Curculionidae: Entiminae (Part 1)*. Phytobiini, Polydrusini and Cyphicerini (Coleoptera). 406 pp. Touka Shobo, Fukuoka.
- Morris MG. 2002. *True Weevils (Part I): Coleoptera: Curculionidae (Subfamilies Raymondionyminae to Smicronychinae)*. Hollis D, Ed. London [UK]: Royal Entomology Society and The Field Studies Council.
- Spilman TJ. 1991. Darkling beetles (Tenebrionidae, Coleoptera). *Insect and Mite Pests in Food USDA 1*: 185-199.
- Umeya K and Okada T. 2003. *Agricultural Insects Pests in Japan*.
- Yoshitake H. 2017. Habitus Identification of Weevils. Institute for Agro-Environmental Sciences NARO, Tsukuba, Japan.

**LIST OF PARTICIPANTS**

**Ittipon Bannakan**

Professional Entomologist,  
Department of Agriculture  
Ladyao Chatuchak 50 Phaholythin Rd.,  
Bangkok, Thailand  
Tel: +662-9406304  
E-mail: bannakan@hotmail.com

**Dr. Hoang Kim Thoa**

Plant Quarantine Diagnostic Centre,  
Plant Protection Department,  
Hanoi, Vietnam  
Tel: +84-38573424  
E-mail: thoa\_hoangkim75@yahoo.com

**Kemas Usman**

Plant Quarantine Officer,  
Indonesian Agricultural Quarantine Agency,  
Ministry of Agriculture  
Tel: +62-21-7816482  
E-mail: usman.kiemas18@gmail.com

**TRAINING COORDINATOR**

**Dr. Soetikno S. Sastroutomo**

Training Coordinator & Technical Secretary,  
c/o CABI-SEA, P.O. Box 210, UPM Post,  
43400 Serdang, Selangor, Malaysia  
Tel: +60-12-6342945  
E-mail: ssoetikno@gmail.com

**LIST OF INSTRUCTORS/FACILITATOR**

**Keiko Natsuaki, Ph.D.**

Department of International Agricultural  
Development,  
Tokyo University of Agriculture - Setagaya,  
Tel: +81-3-5477-2412  
E-mail: keiko@nodai.ac.jp

**Hiroaki Kojima, Ph.D.**

Laboratory of Entomology,  
Tokyo University of Agriculture - Atsugi,  
Tel: +81-46-270-6365  
E-mail: h3kojima@nodai.ac.jp

**Yukio Yokoi**

Yokohama Plant Protection Station  
Research Division,  
Ministry of Agriculture, Forestry, and  
Fisheries,  
Tel: +81-45-622-8842

**Ren Iwaizumi**

Yokohama Plant Protection Station  
Research Division,  
Ministry of Agriculture, Forestry, and  
Fisheries,  
Tel: +81-45-622-8842  
E-mail: iwaizumir@pps.maff.go.jp

**Higo Yuichi**

Yokohama Plant Protection Station  
Research Division,  
Ministry of Agriculture, Forestry, and  
Fisheries,  
Tel: +81-45-622-8842

**Matsumoto**

Yokohama Plant Protection Station  
Research Division,  
Ministry of Agriculture, Forestry, and  
Fisheries,  
Tel: +81-45-622-8842

**Yamaguchi**

Yokohama Plant Protection Station  
Research Division,  
Ministry of Agriculture, Forestry, and  
Fisheries,  
Tel: +81-45-622-8842

**Shuichi Uchiyama**

Yokohama Plant Protection Station  
Tsukuba Center,  
Ministry of Agriculture, Forestry, and  
Fisheries,  
Tel: +81-29-855-7832  
E-mail: uchiyamas@pps.maff.go.jp

**Tatsuo Matsuda**

Kobe Plant Protection Station Research  
Division,  
Ministry of Agriculture, Forestry, and  
Fisheries,  
Tel: +81-78-331-1026  
E-mail: ta20\_matsuda@wombat.2ag.ne.jp

**Dr. Akihiro Miyano**

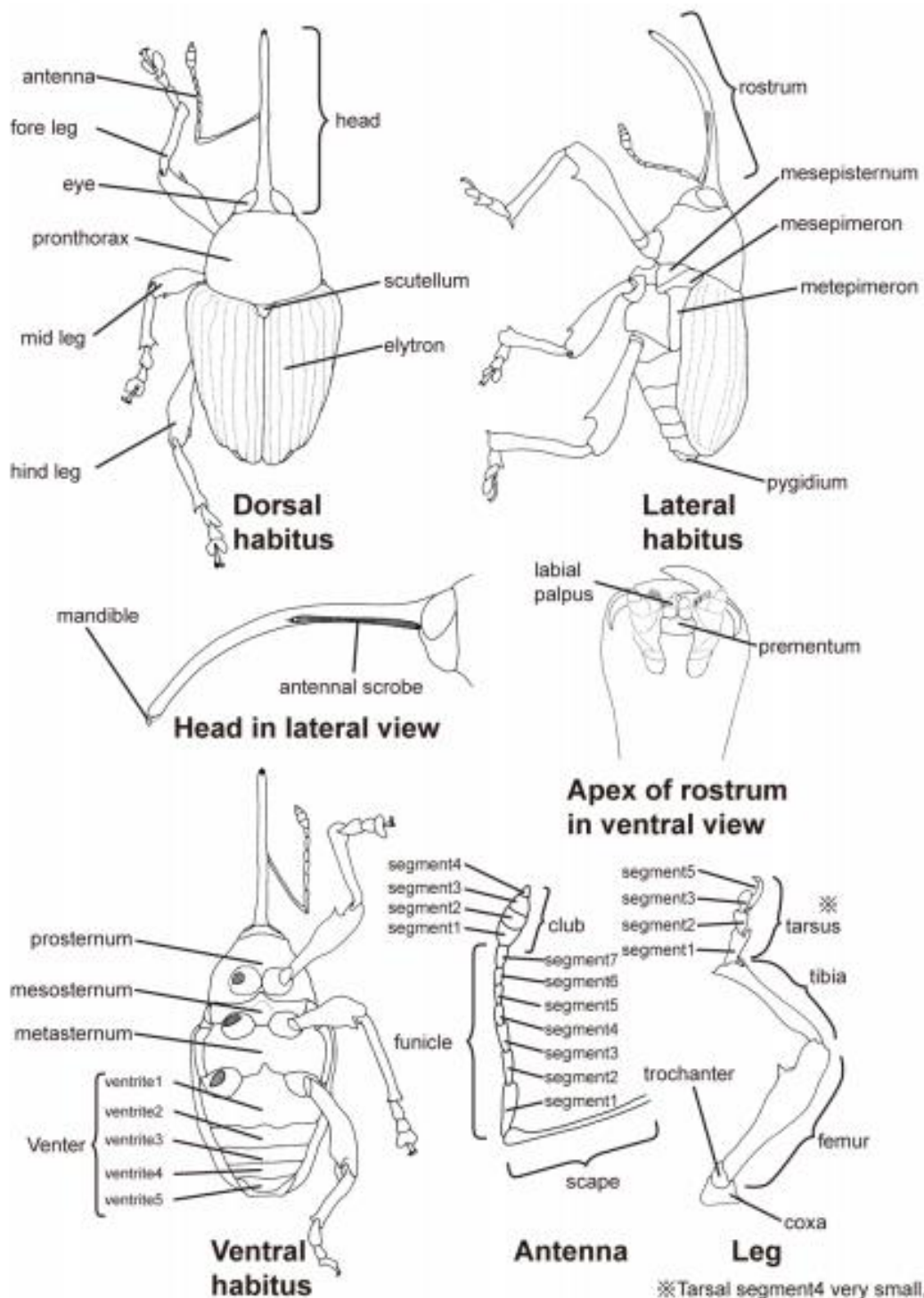
Food Entomology Laboratory,  
National Food Research Institute,  
Tel: +81-29-838-8081  
E-mail: akihirom@affrc.go.jp

**MANUAL IDENTIFICATION OF WEEVILS**

Lecture Notes by:  
**Hiroaki Kojima, Ph.D.**  
 (Tokyo University of Agriculture)

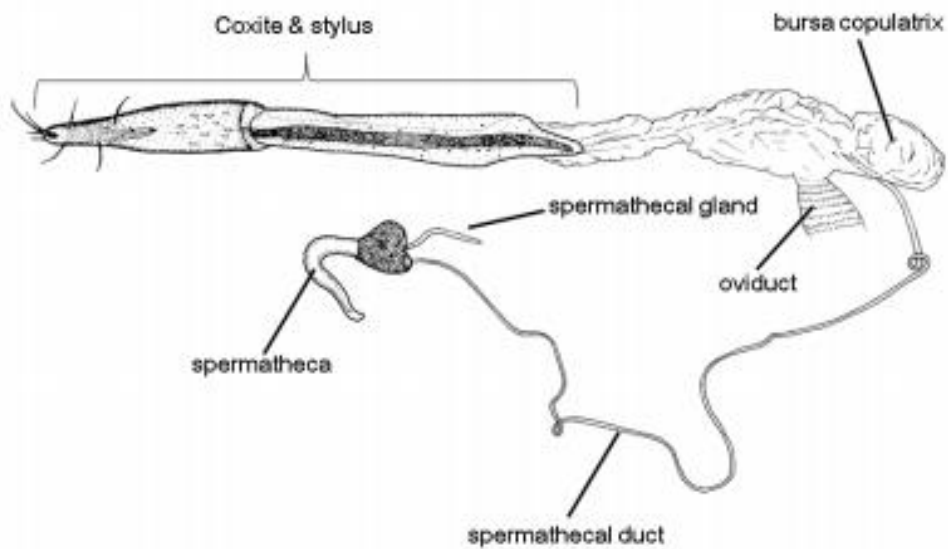
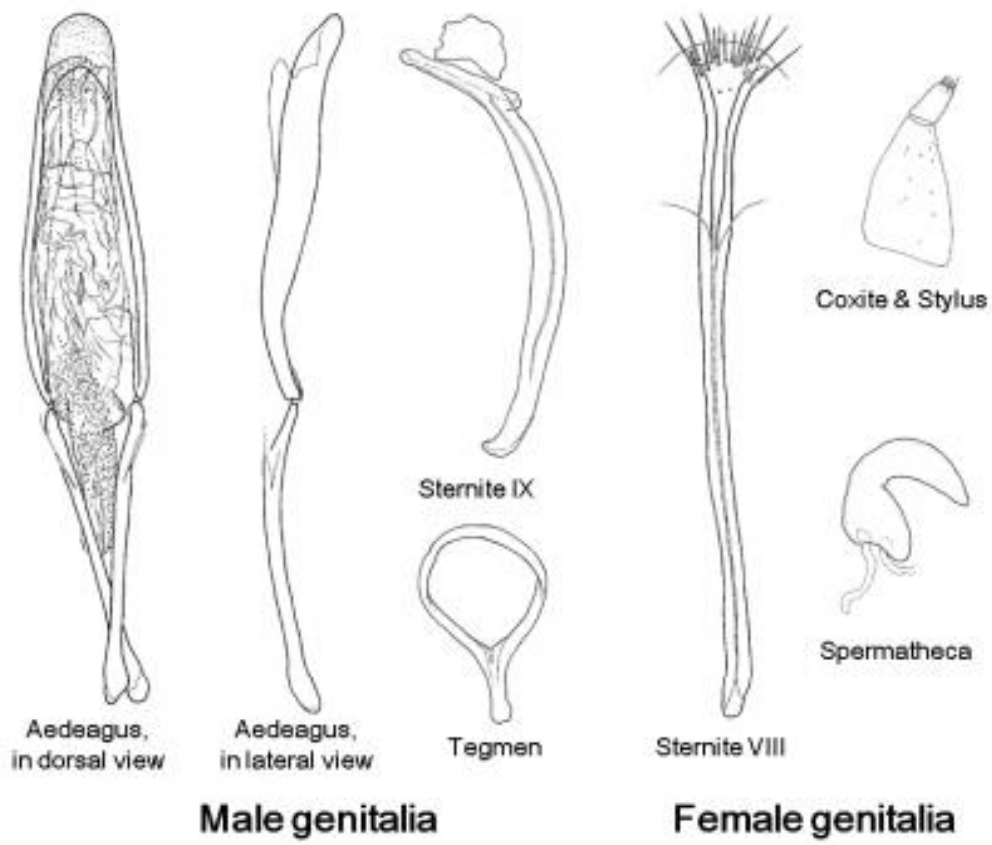
**HABITUS IDENTIFICATION OF WEEVILS**

**1. Morphology and Terminology – Adults: General**



※Tarsal segment4 very small, being on the base of segment5

**1. Morphology and Terminology – Adults: Genitalia**



## 2. Morphology and Terminology – Larvae (Oberprieler et al. 2014)

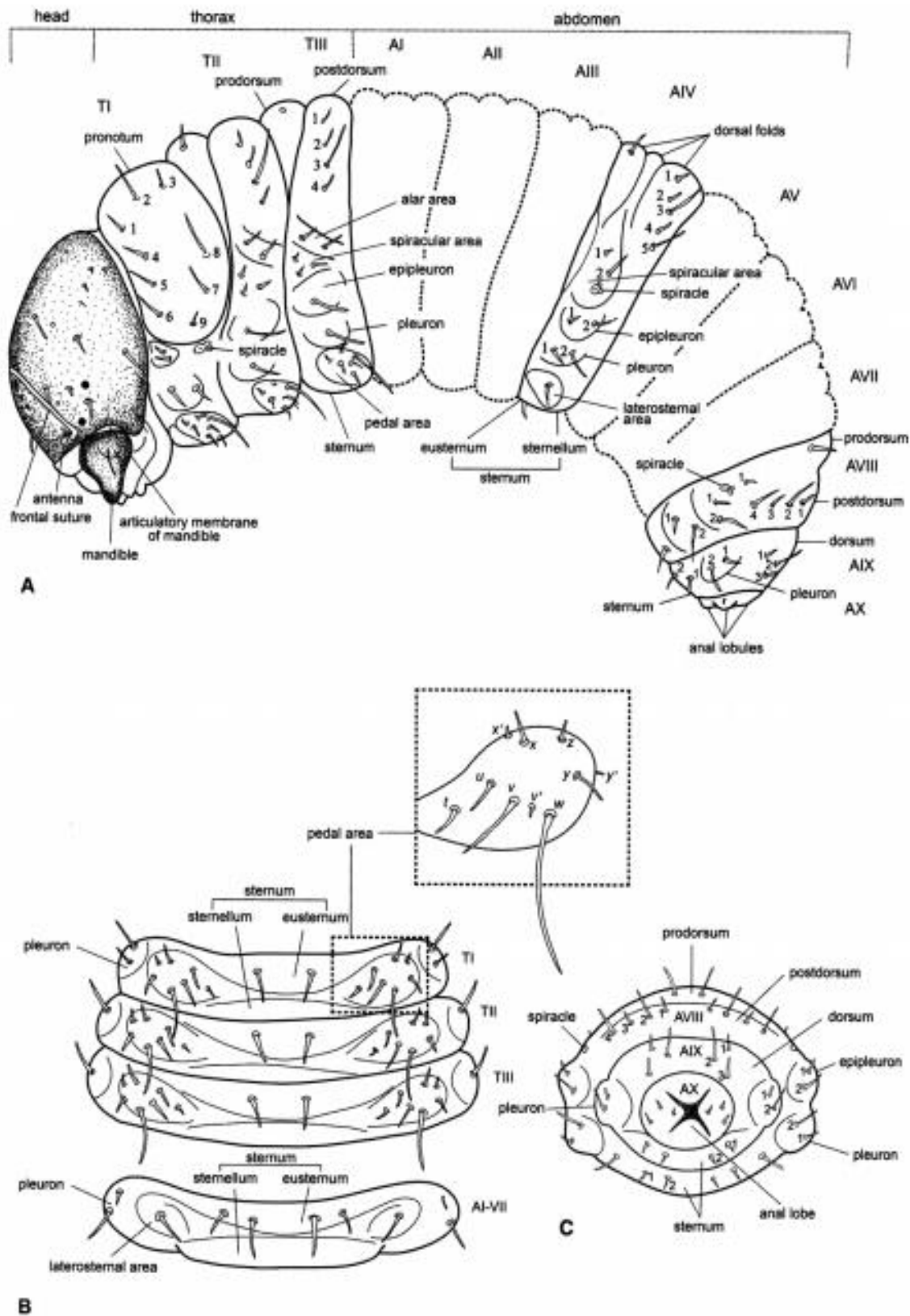


Fig. 3.5 Structure and chaetotaxy of generalized weevil larva (modified after Marvaldi 1999). A, lateral view; B, ventral view; C, caudal view.

### 3. Morphology and Terminology – Pupae (Oberprieler et al. 2014)

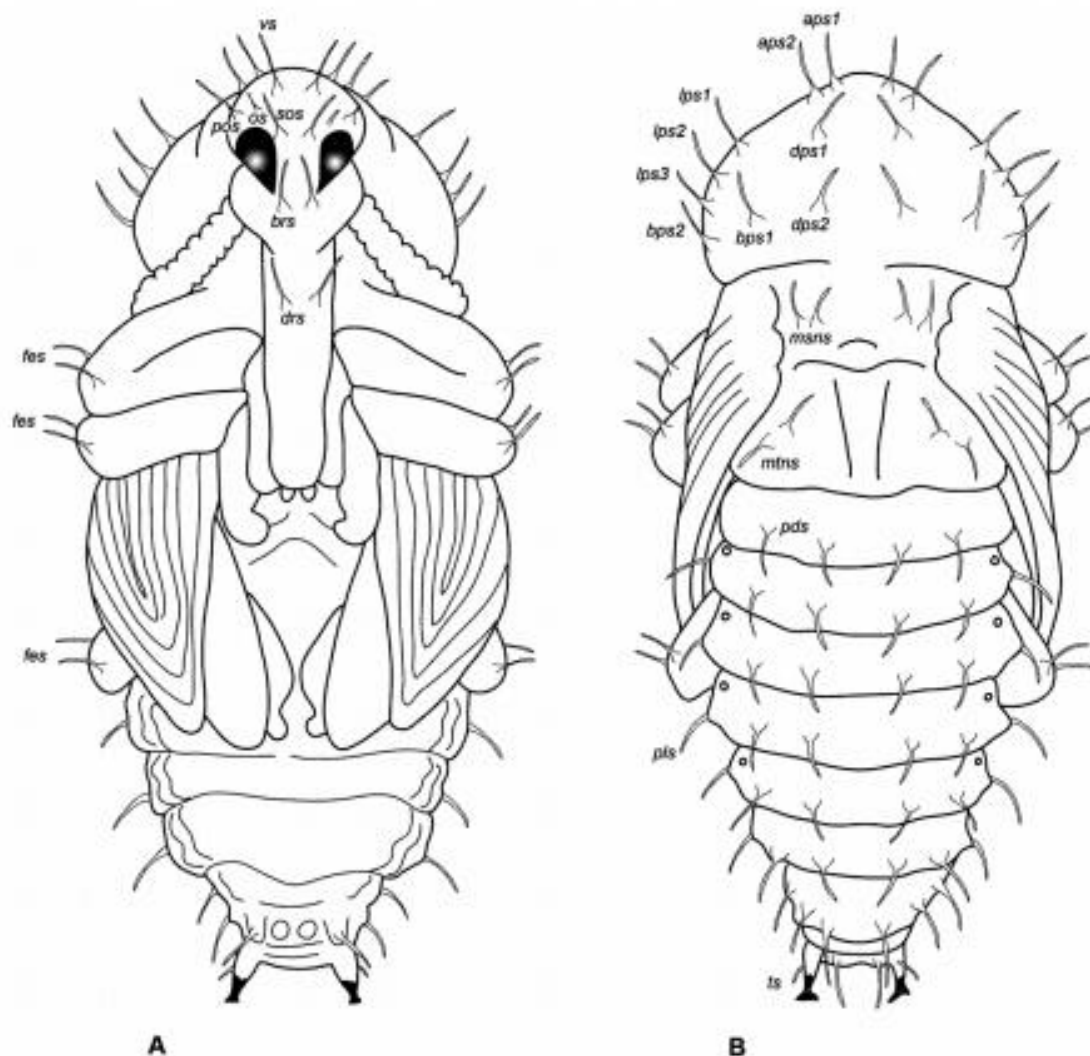


Fig. 3.6 Structure and chaetotaxy of weevil pupa (*Tranes* Schoenherr, Curculionidae) (modified after May 1994). A, ventral view; B, dorsal view (*aps*, apical pronotal seta; *bps*, basal pronotal seta; *brs*, basistrostral seta; *dps*, discal pronotal seta; *drs*, distirostral seta; *fes*, femoral seta; *lps*, lateral pronotal seta; *mans*, mesonotal seta; *mtms*, metanotal seta; *os*, orbital seta; *pds*, postdorsal seta; *pos*, postorbital seta; *sos*, supraorbital seta, *pls*, pleural seta; *ts*, tergal seta; *vs*, vertical seta).

Weevil pupae are exarate, with free appendices and distinct body regions (head, thorax, abdomen). The integument is usually creamy white. Setae vary in shape, number and disposition in different taxa. The head is deflexed beneath the prothorax and the rostrum onto the legs.

## HABITUS IDENTIFICATION OF WEEVILS

### 2. Identification of specimens using keys

In this training workshop, a key to major families of the superfamily Curculionoidea and a key to major subfamilies of the family Curculionidae mainly from the ASEAN region are provided in order to learn how to sort weevil specimens based on morphological traits.

In addition, an illustrated key to *Caulophilus oryzae* (Curculionidae) and *Sitophilus* species (Dryophthridae), all of which are important storage pests, is given in order to learn species identification of weevils practically based on morphological traits.

See Appendix: Glossary of Weevil Characters when necessary.

## Major Curculionoidea families from ASEAN Region



1. Anthribidae



2. Scolytidae



3. Platypodidae



4. Attelabidae



5. Rhyncitidae



6. Dryophthridae



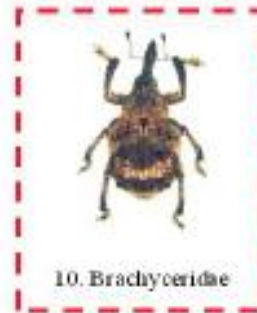
7. Apionidae



8. Nanophytidae



9. Brentidae



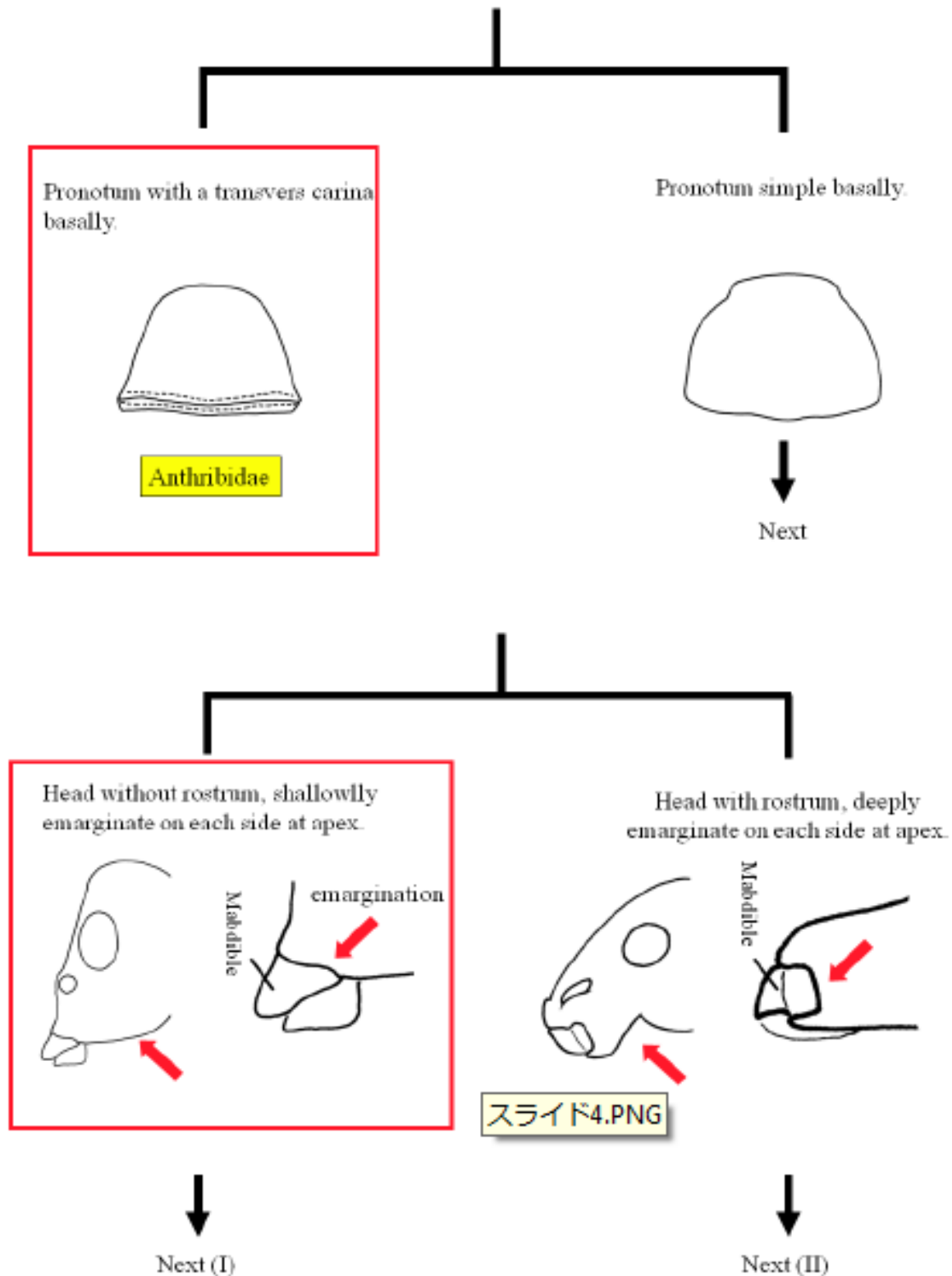
10. Brachyceridae

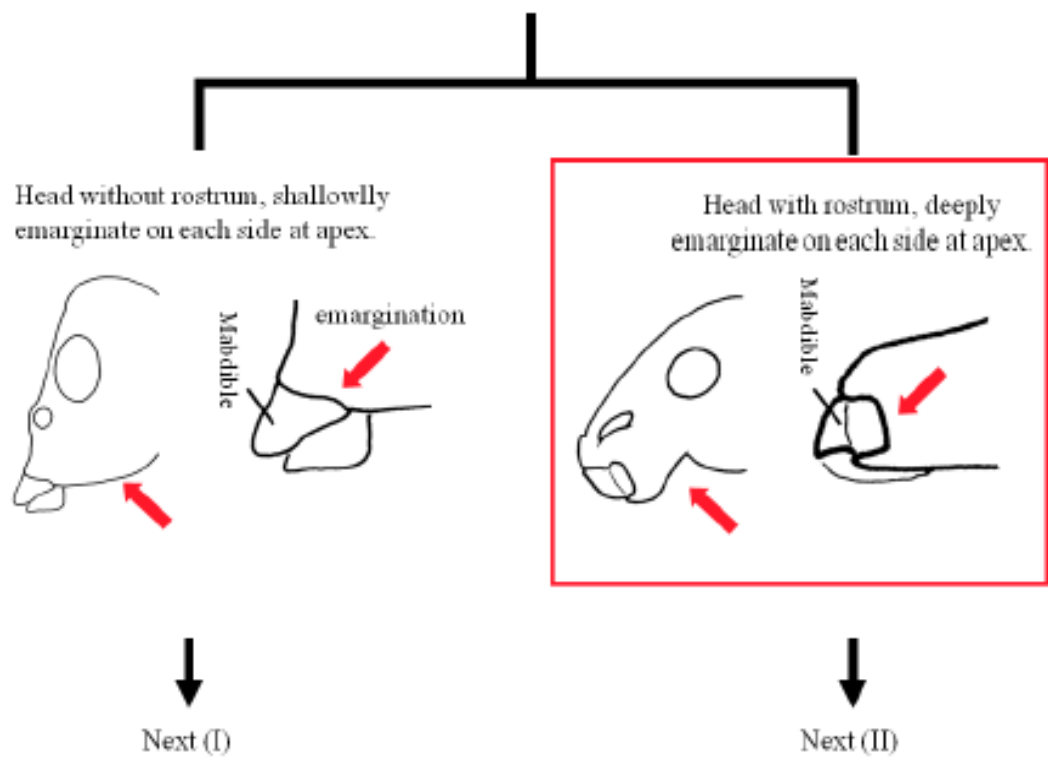
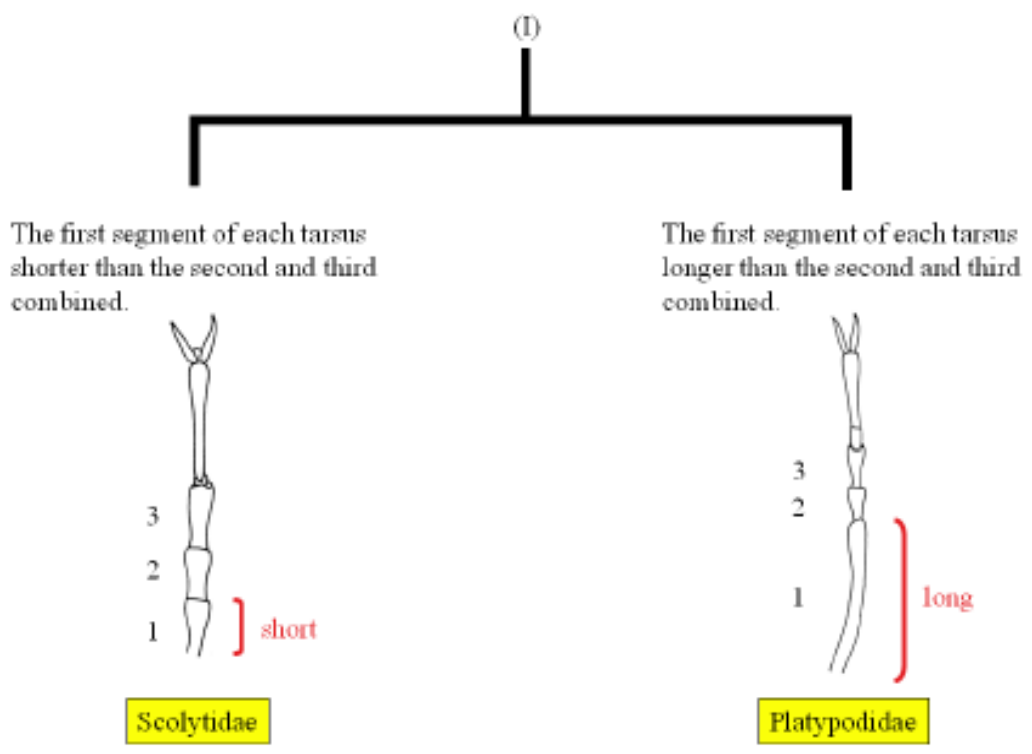


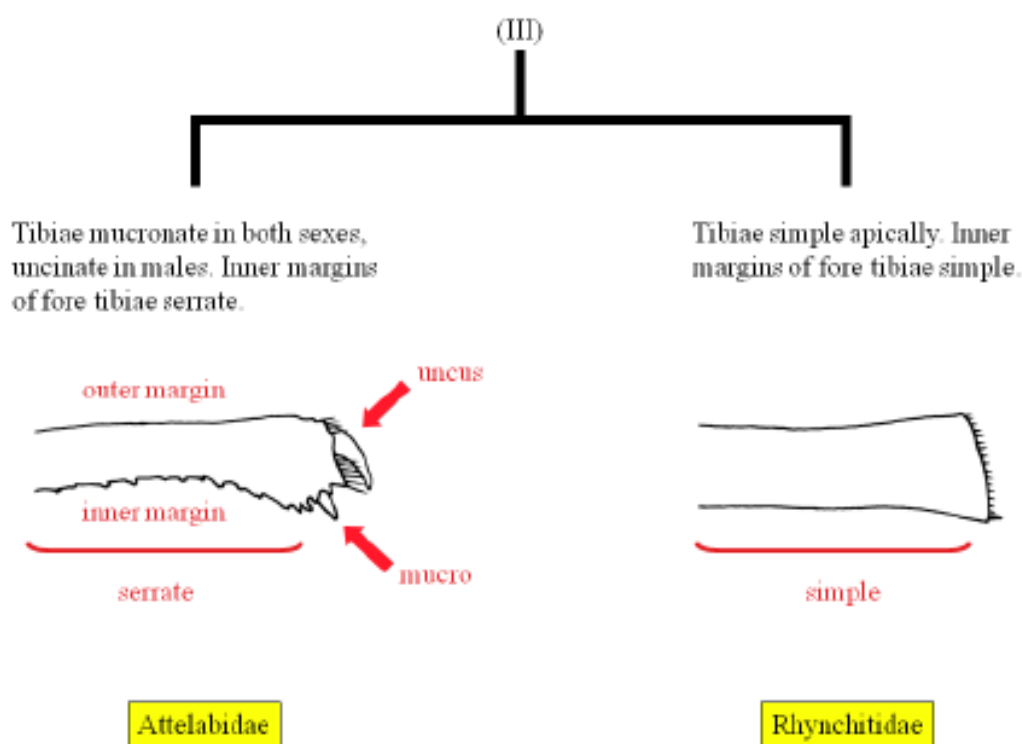
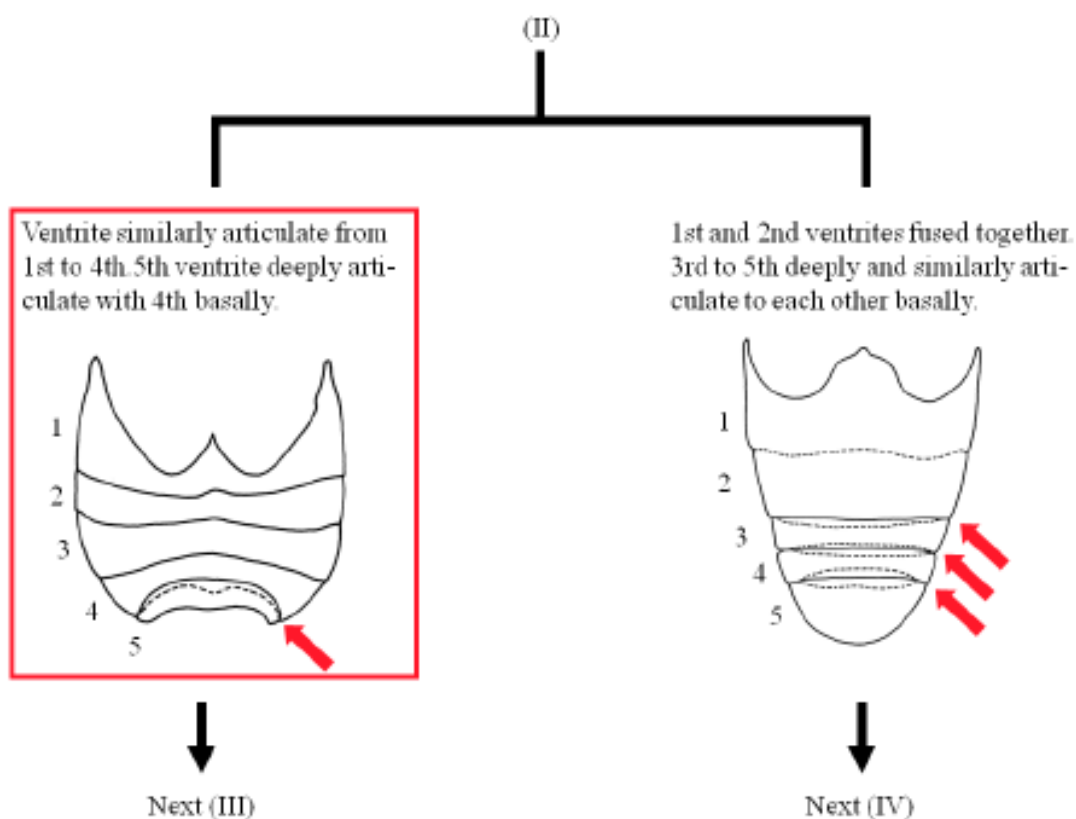
11. Curculionidae

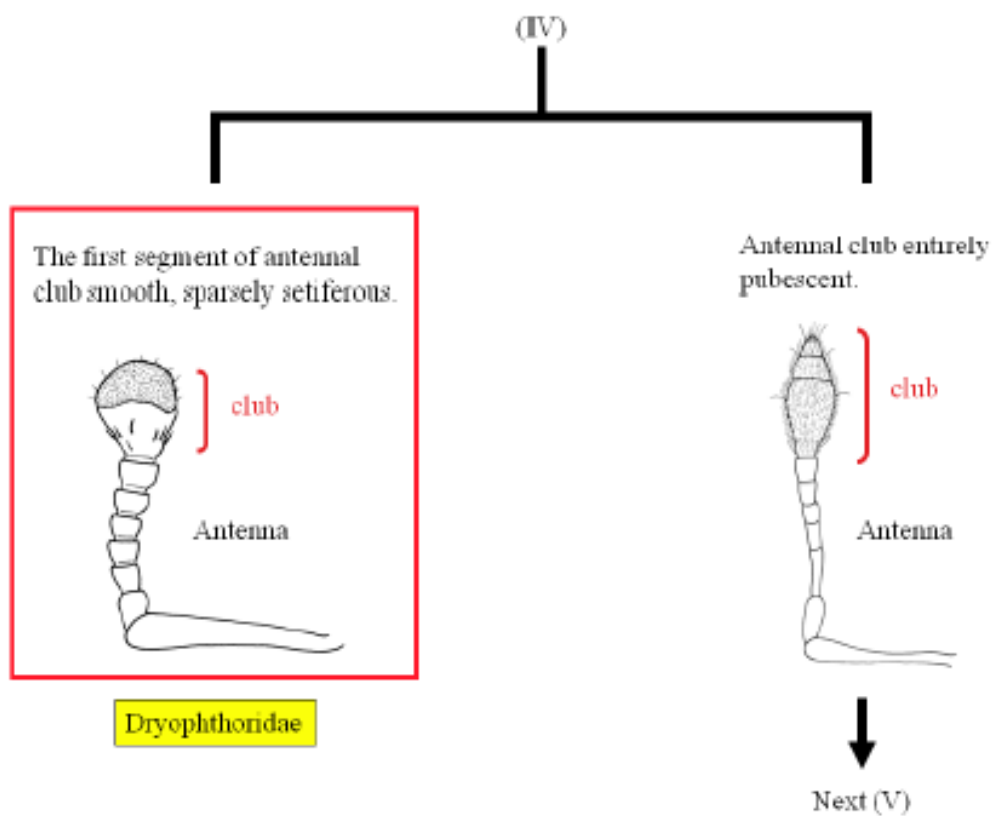
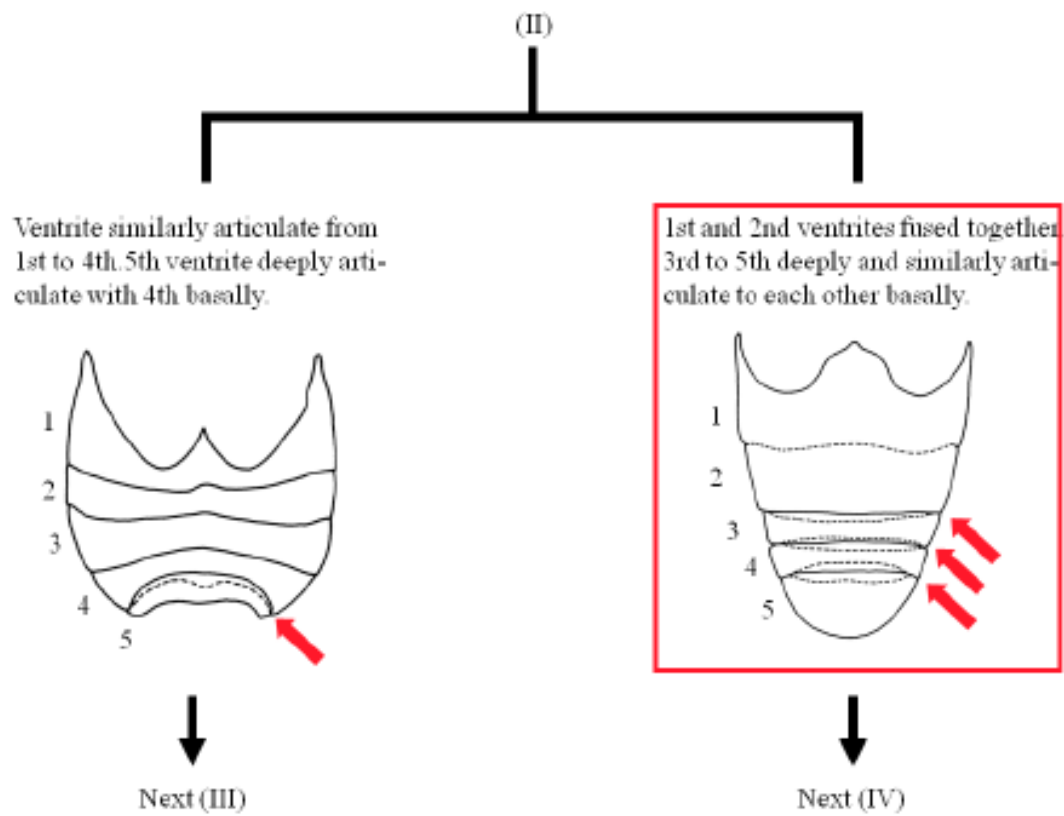
11 major families are known from the ASEAN region

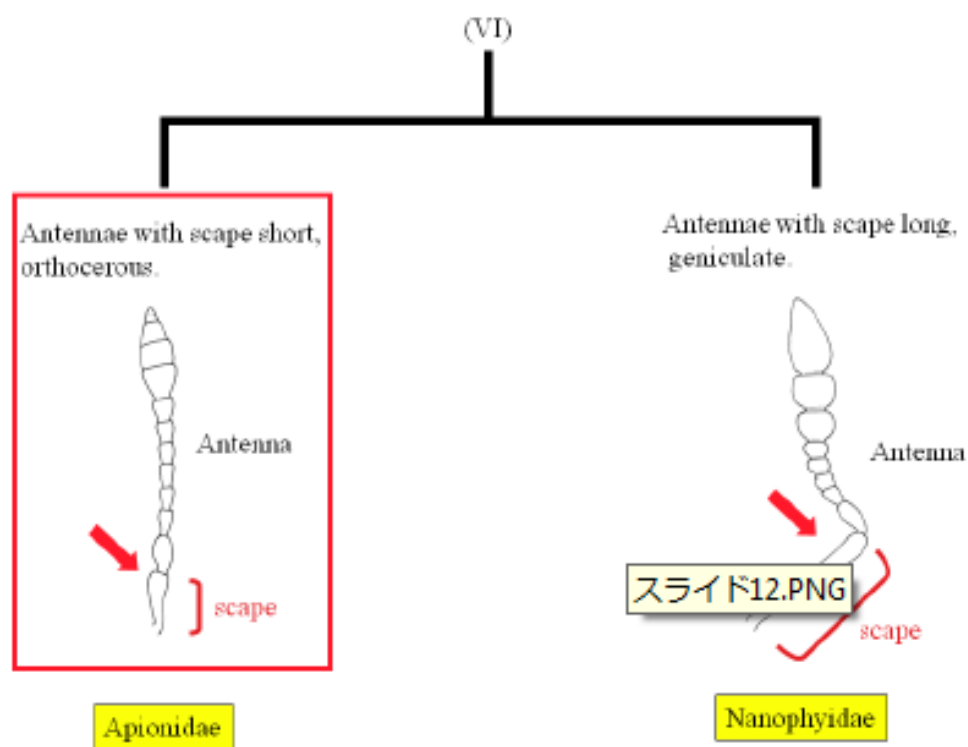
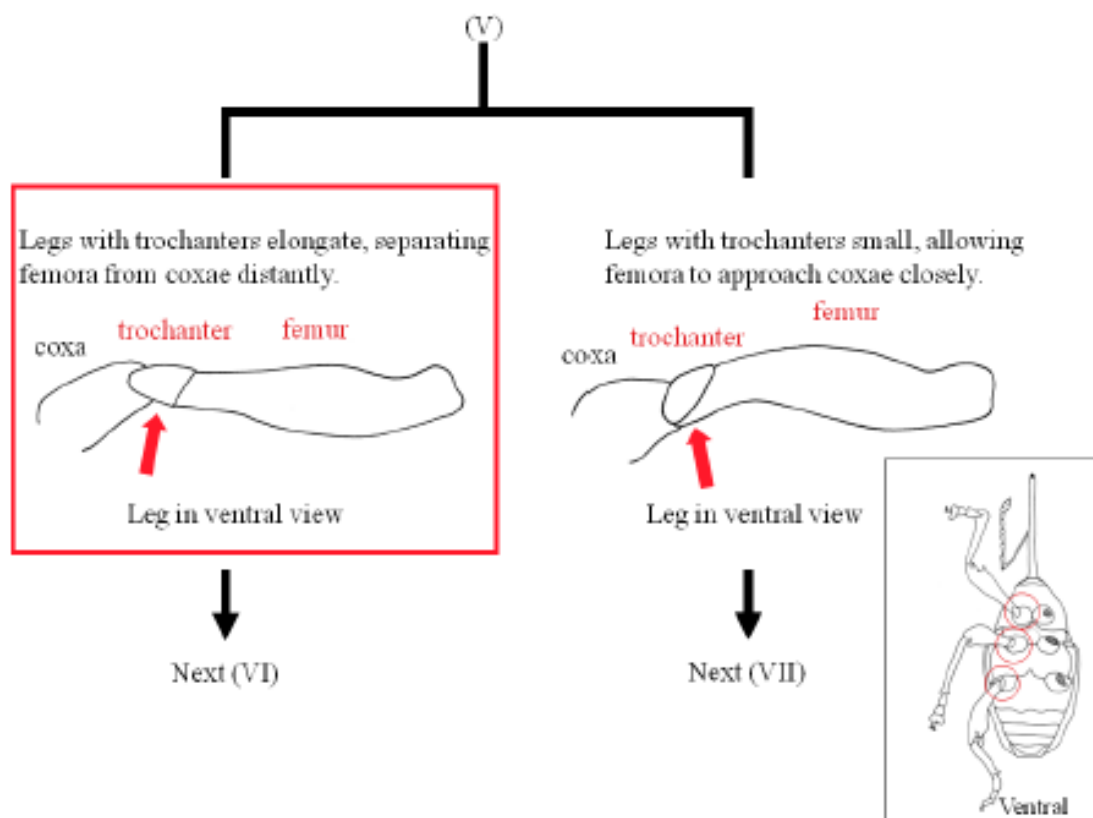
# An Illustrated Key to Major Curculionidea Families from the ASEAN Region

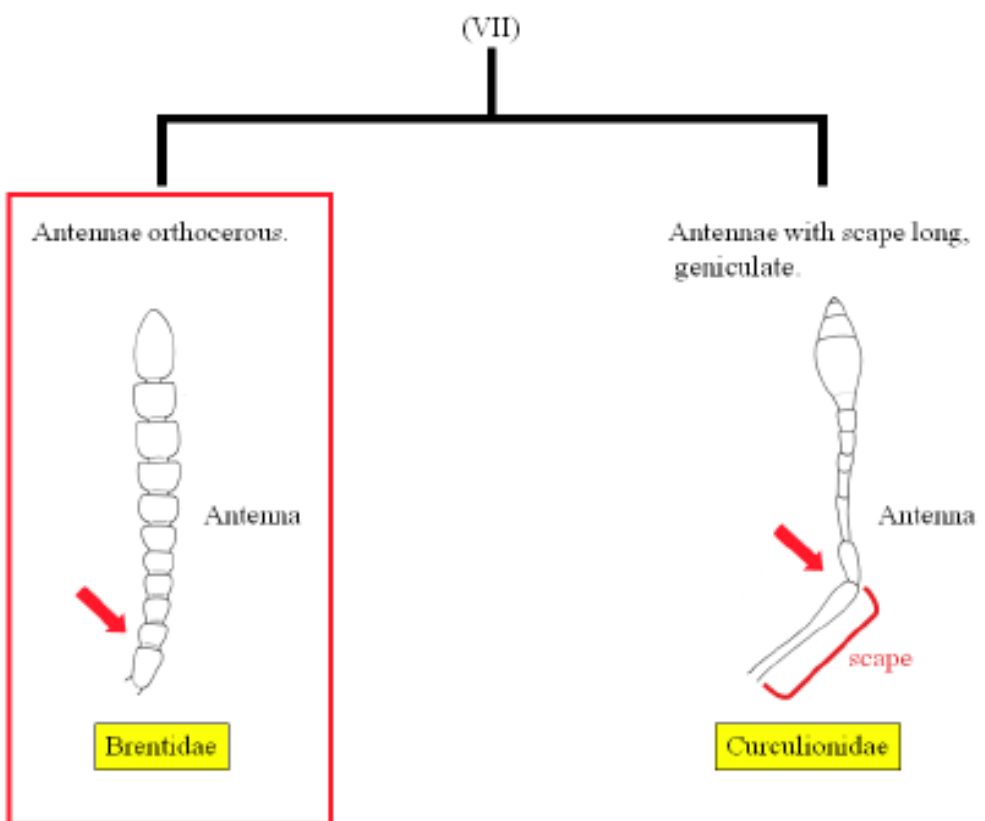
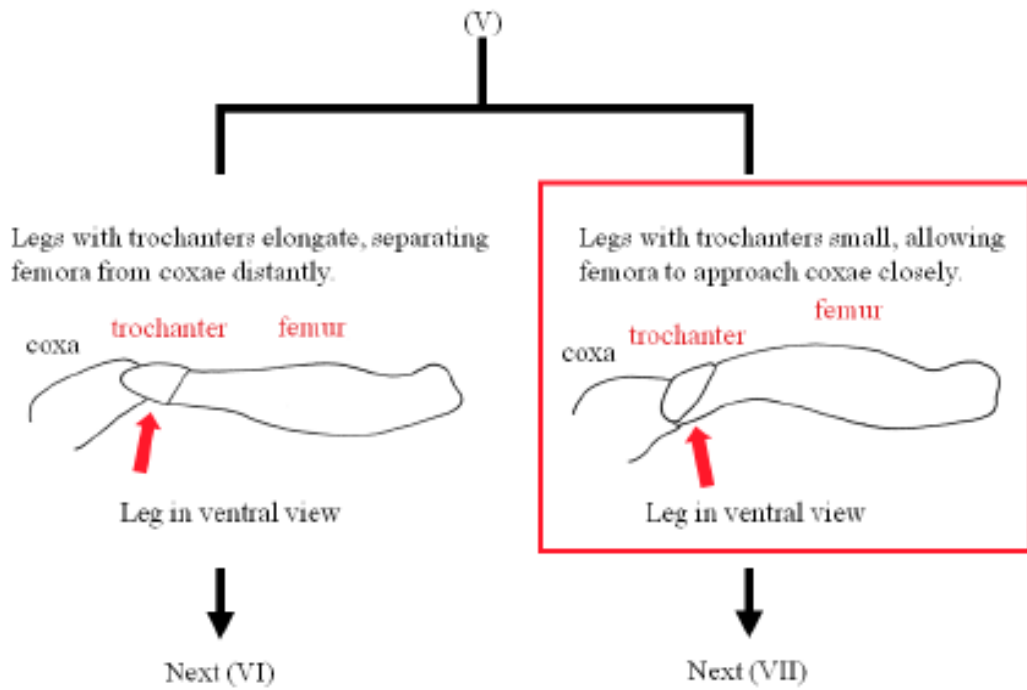












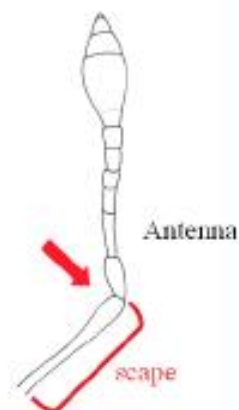
(VII)

Antennae orthocerous.



Brentidae

Antennae with scape long, geniculate.



Curculionidae

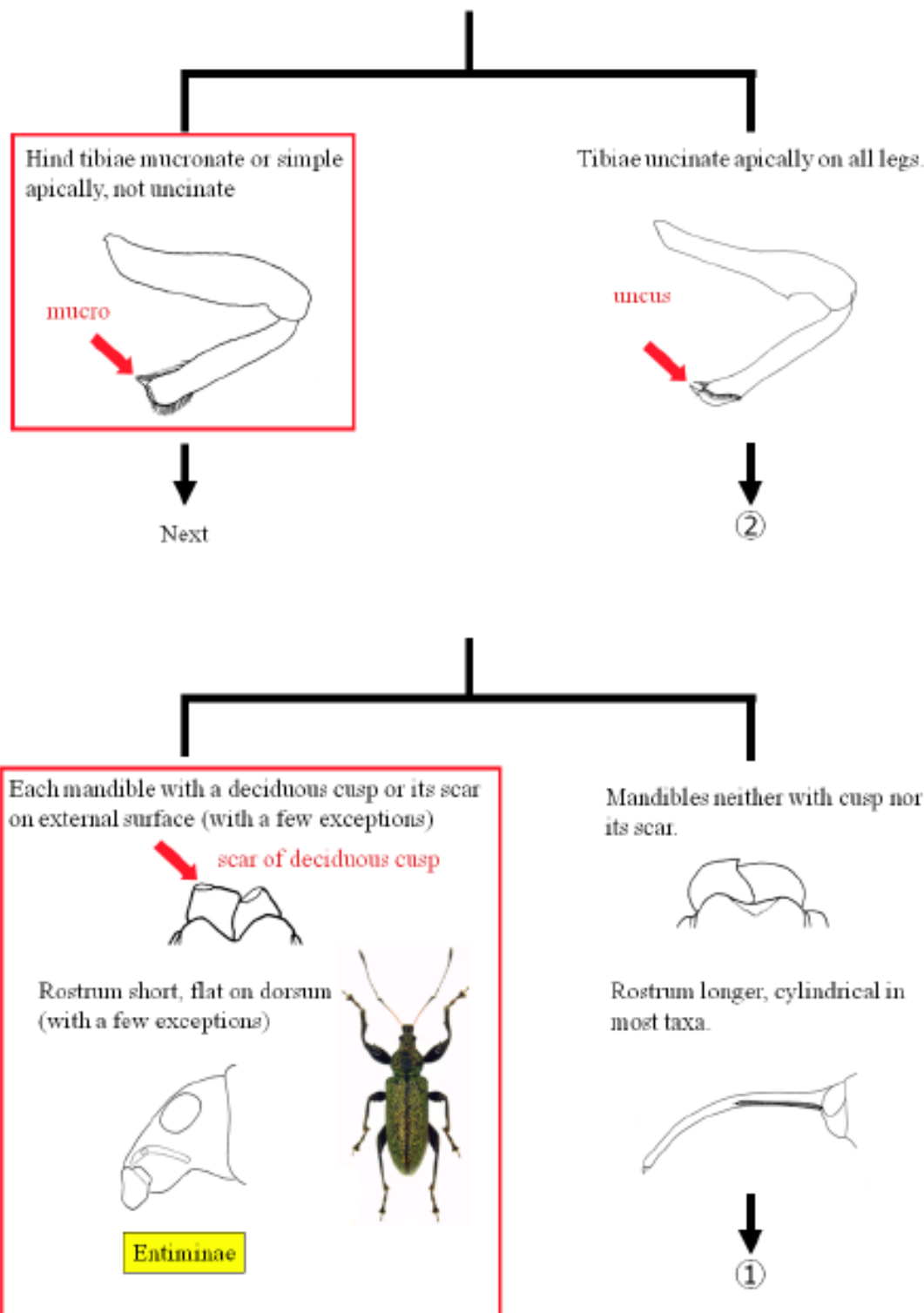
## Brachyceridae

*Desmidophorus crassus*

- Distributed mainly in Africa
- Several species from the ASEAN region
- Containing some pests of *Hybiscus*

スライド16.PNG

# An Illustrated Key to Major Subfamilies of the Family Curculionidae from the ASEAN region



# Entiminae

## Exceptional taxa



### Pachyrhynchini

- Mandibles neither with cusp nor its scar.
- Many species from the Philippines



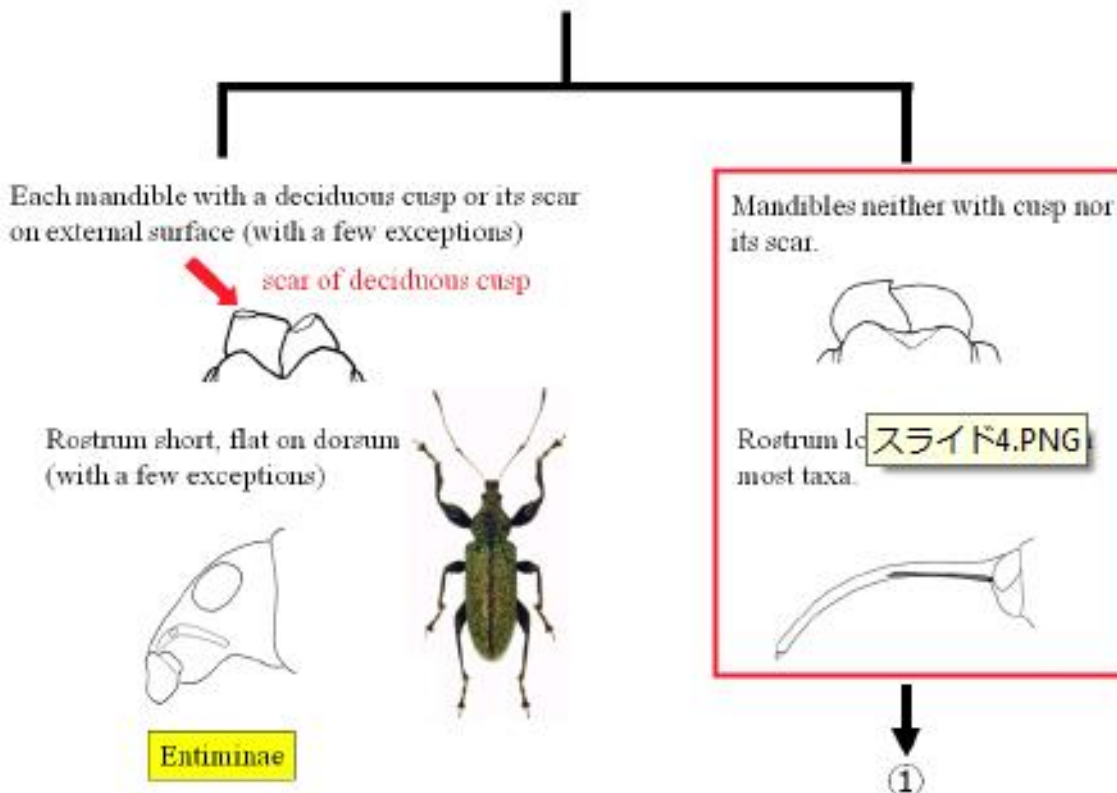
### Sitonini

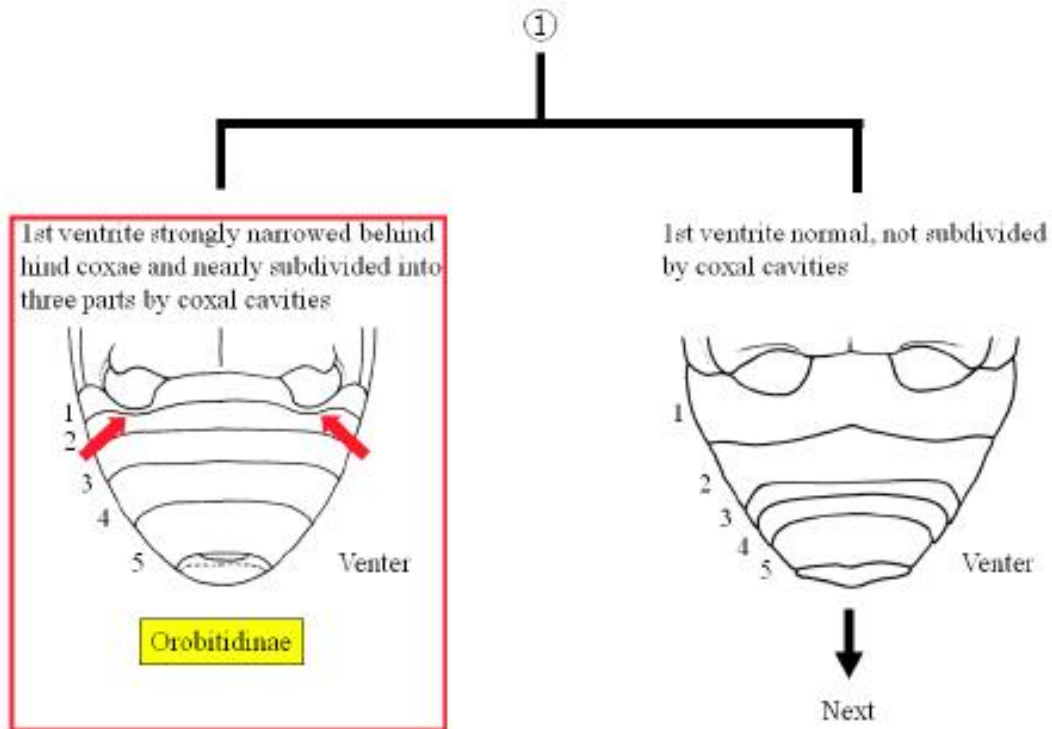
- Mandibles neither with cusp nor its scar.
- Several species from the Philippines



### *Euphyllobiomorphus*

- Rostrum slender, cylindrical
- Known only from the Ryukyus, Japan
- Just great if you find it in the Philippines (possibly in high mountains)





## Orobittidae

- Only 1 sp. of *Orobittis* is known from East Asia
- Feeding on *Violaceae* plants
- Just great if you find it in the ASEAN region (possibly in high mountains)



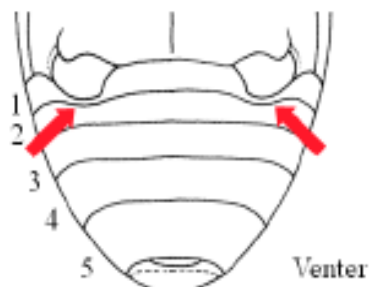
*Orobittis* species



A larva of *Orobittis* species  
in a seed capsule of *Viola* sp.

①

1st ventrite strongly narrowed behind hind coxae and nearly subdivided into three parts by coxal cavities



Orobittidinae

1st ventrite normal, not subdivided by coxal cavities



Next

Mesepimera almost as large as mesepisterna, strongly ascended and visible dorsally between bases of pronotum and elytra.



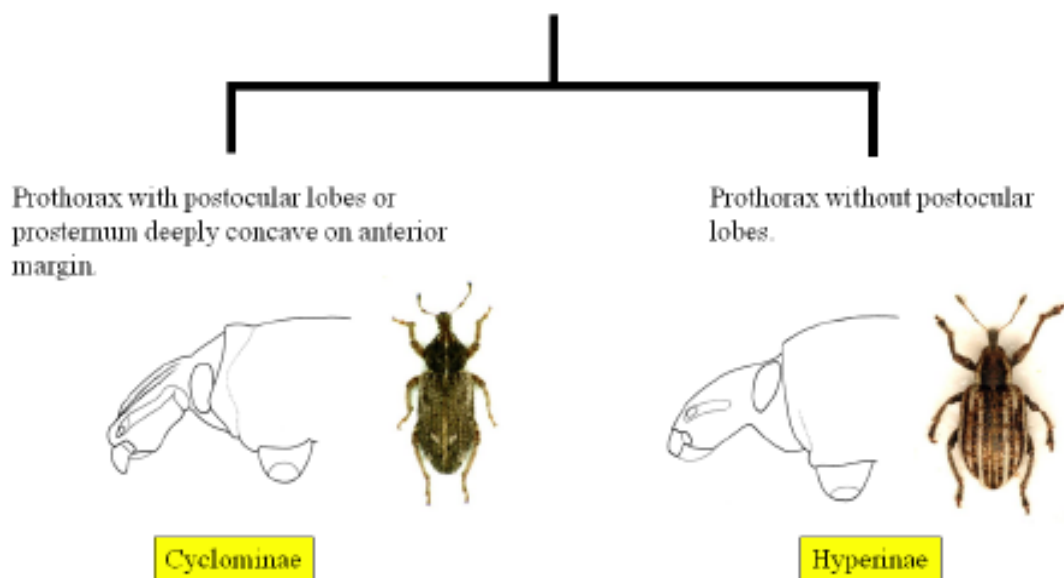
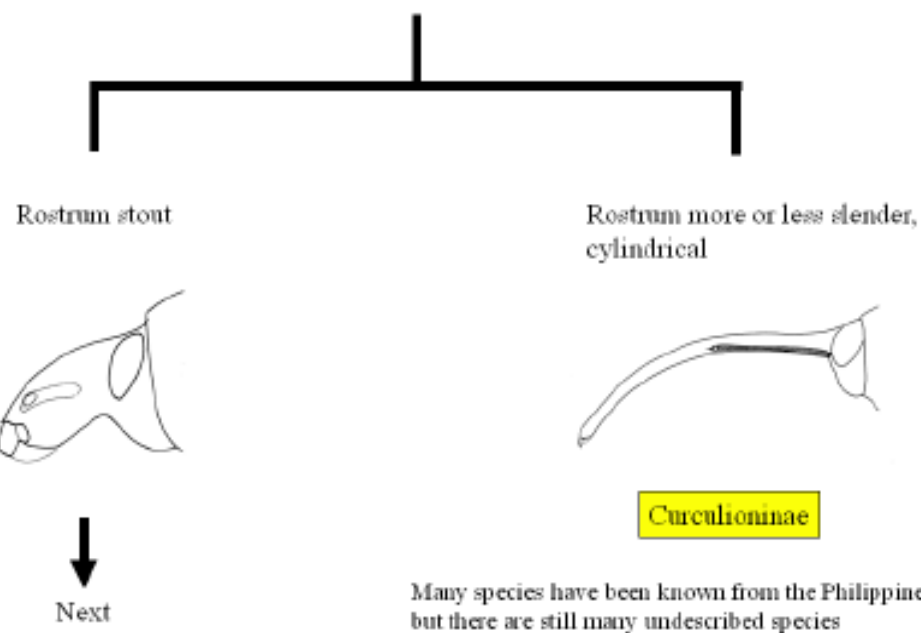
Ceutorhynchinae

Only a few species have been known from the Philippines, but there are many undescribed species

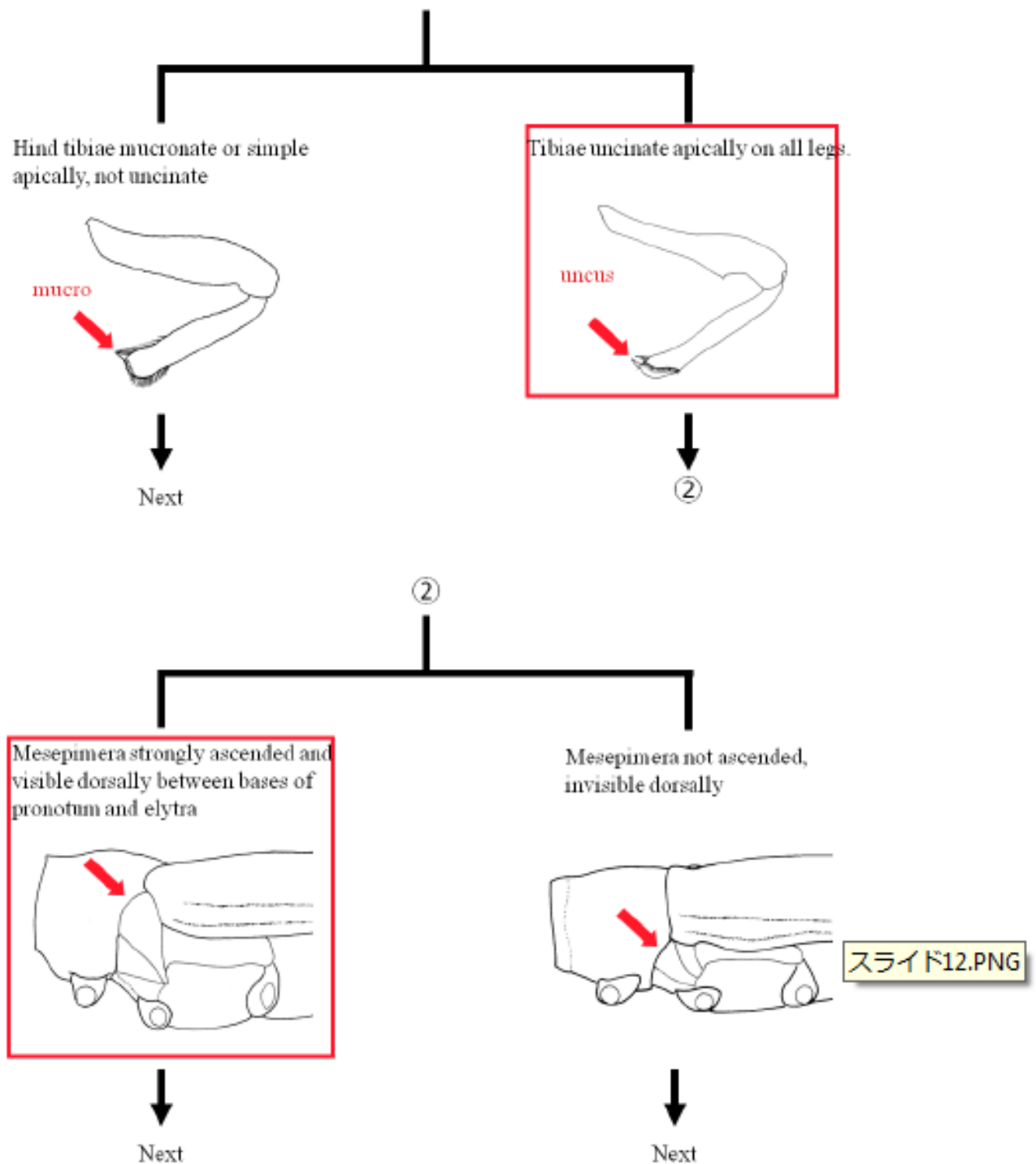
Mesepimera not ascended, invisible dorsally

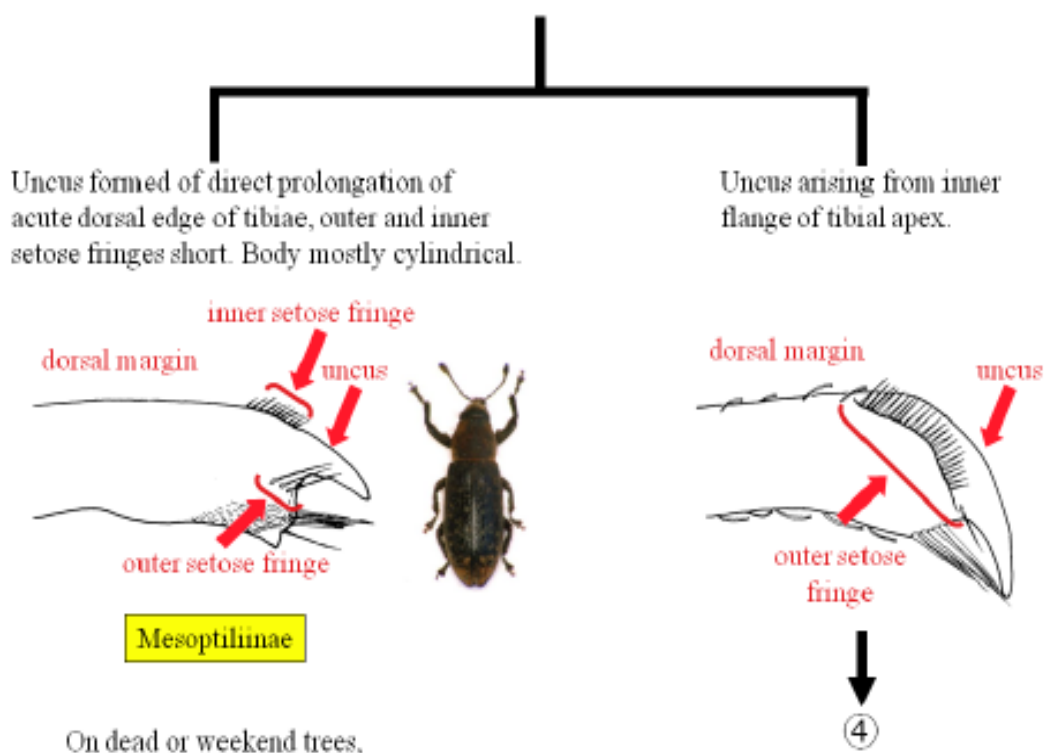
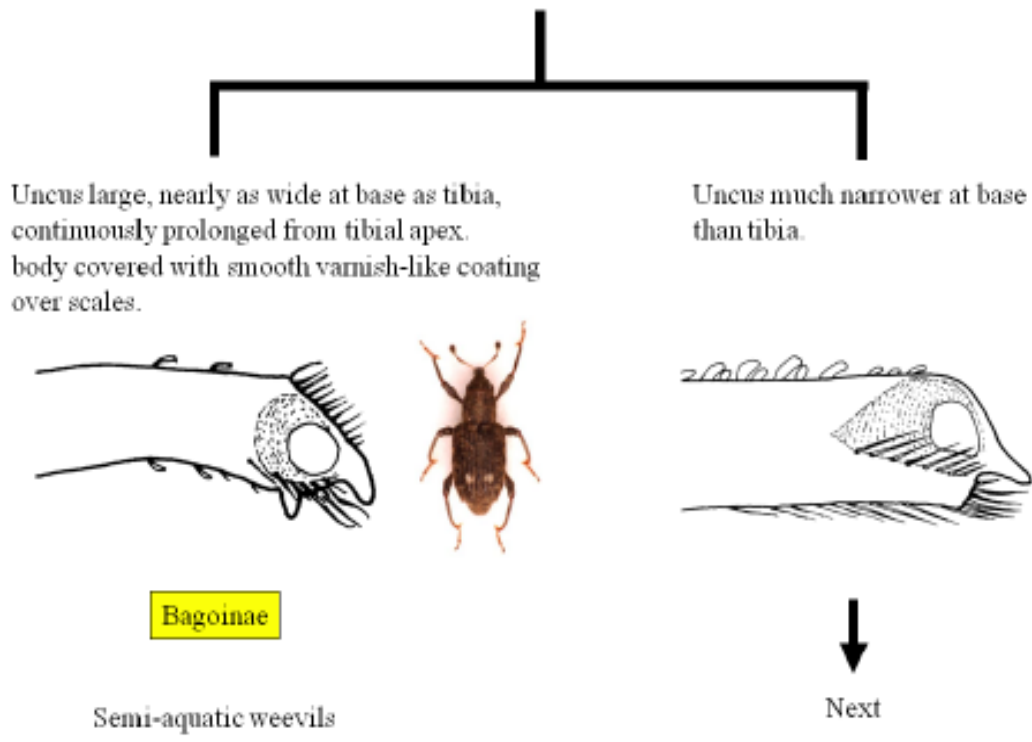


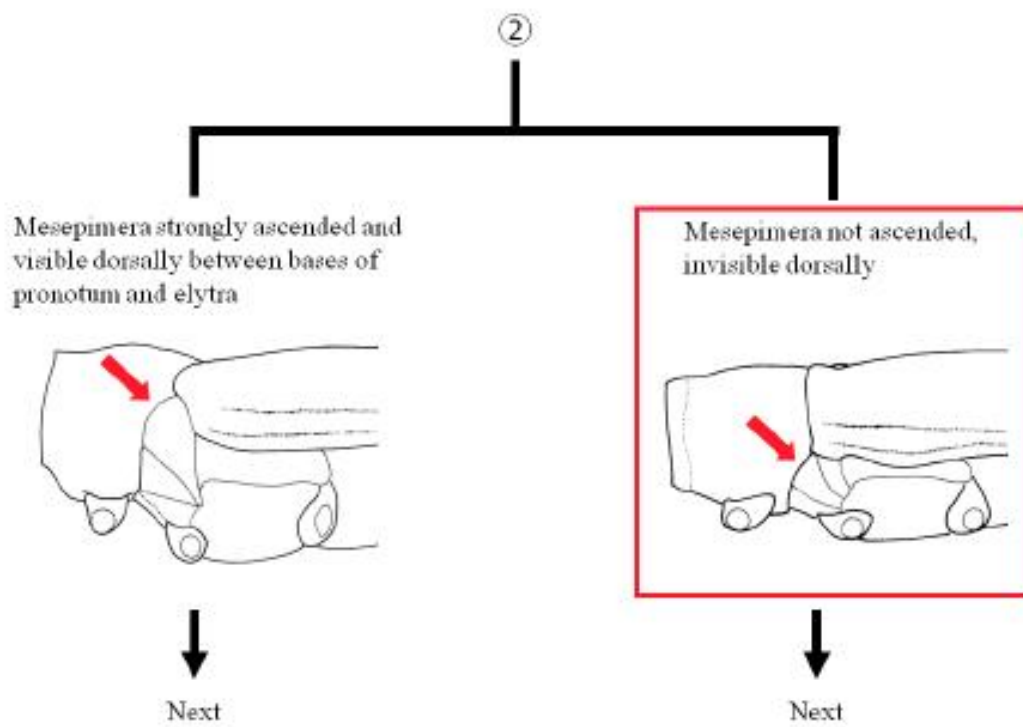
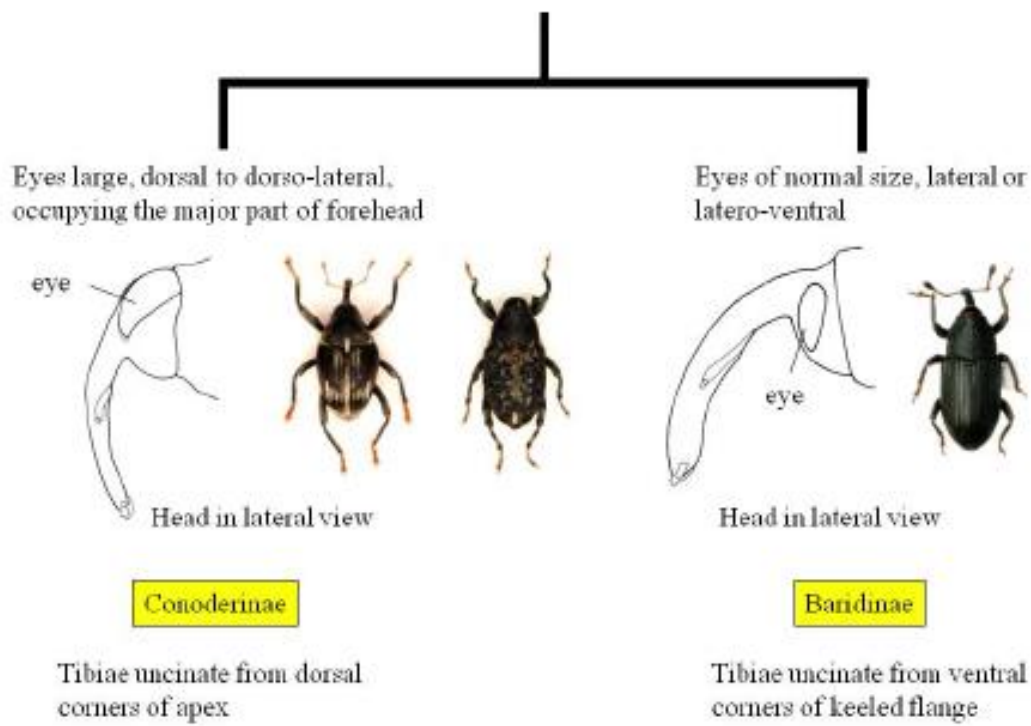
Next

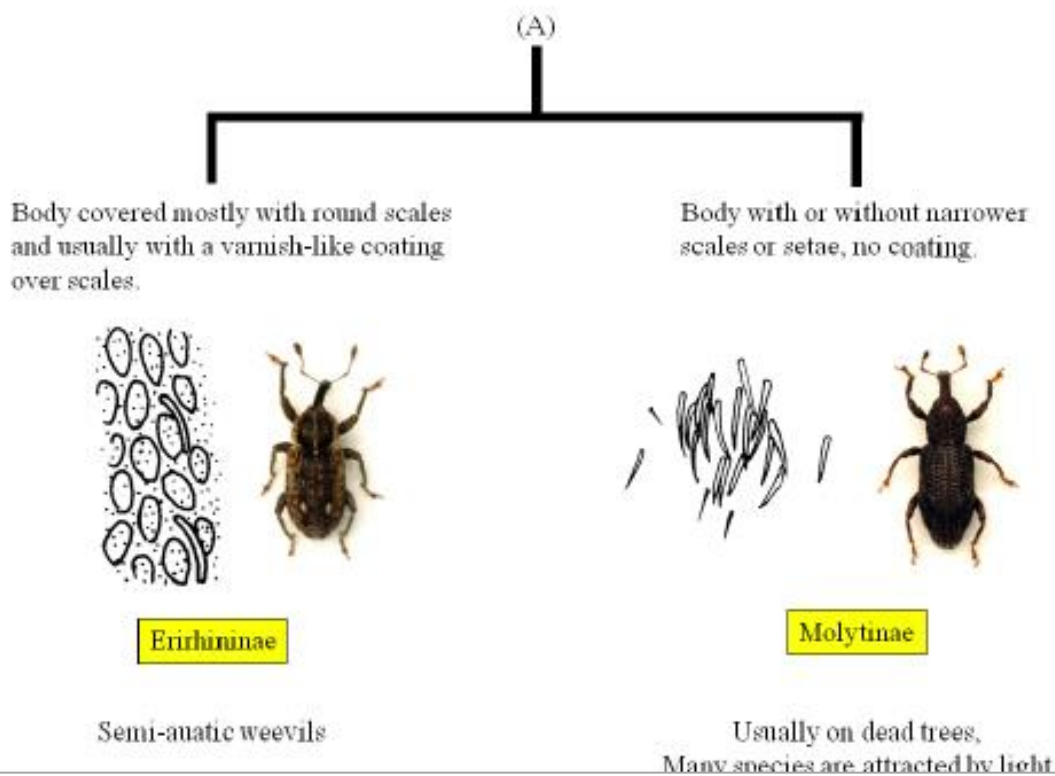
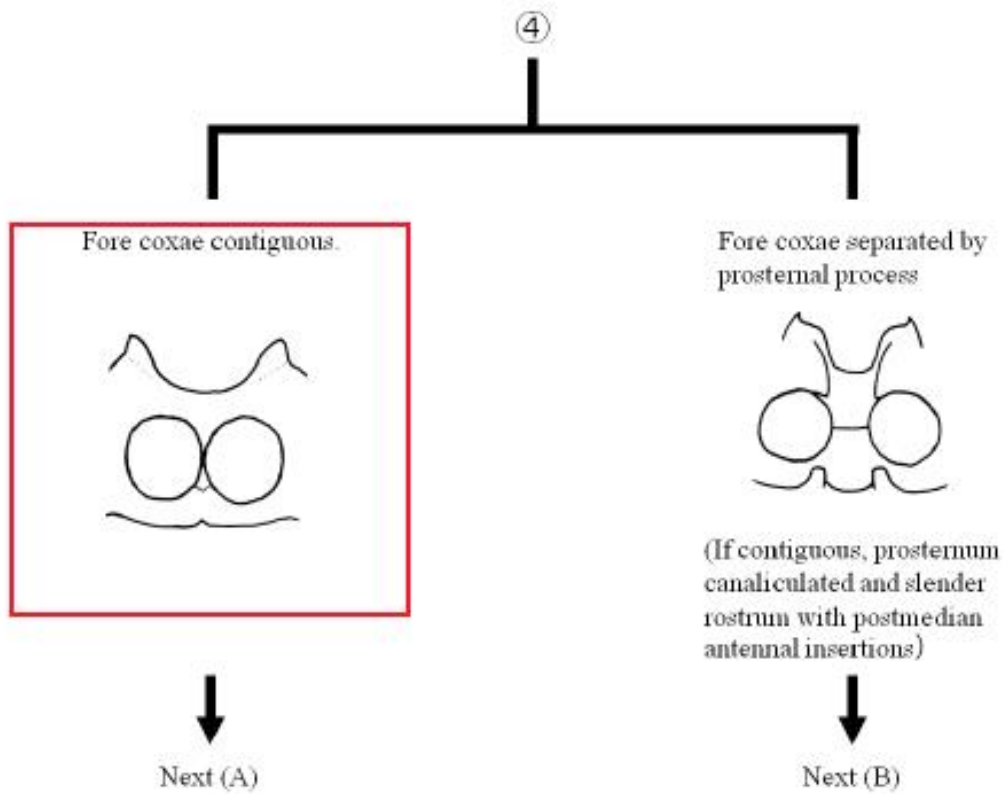


## An Illustrated Key to Major Subfamilies of the Family Curculionidae from the ASEAN region









④

Fore coxae contiguous.



Next (A)

Fore coxae separated by prosternal process

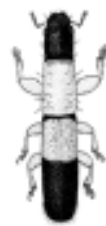


(If contiguous, prosternum canaliculated and slender rostrum with postmedian antennal insertions)

Next (B)

(B)

Rostrum short. Prothorax lacking sternal groove. Body cylindrical.



(Morimoto & Kojima, 2004)

**Phylloplatypodinae**

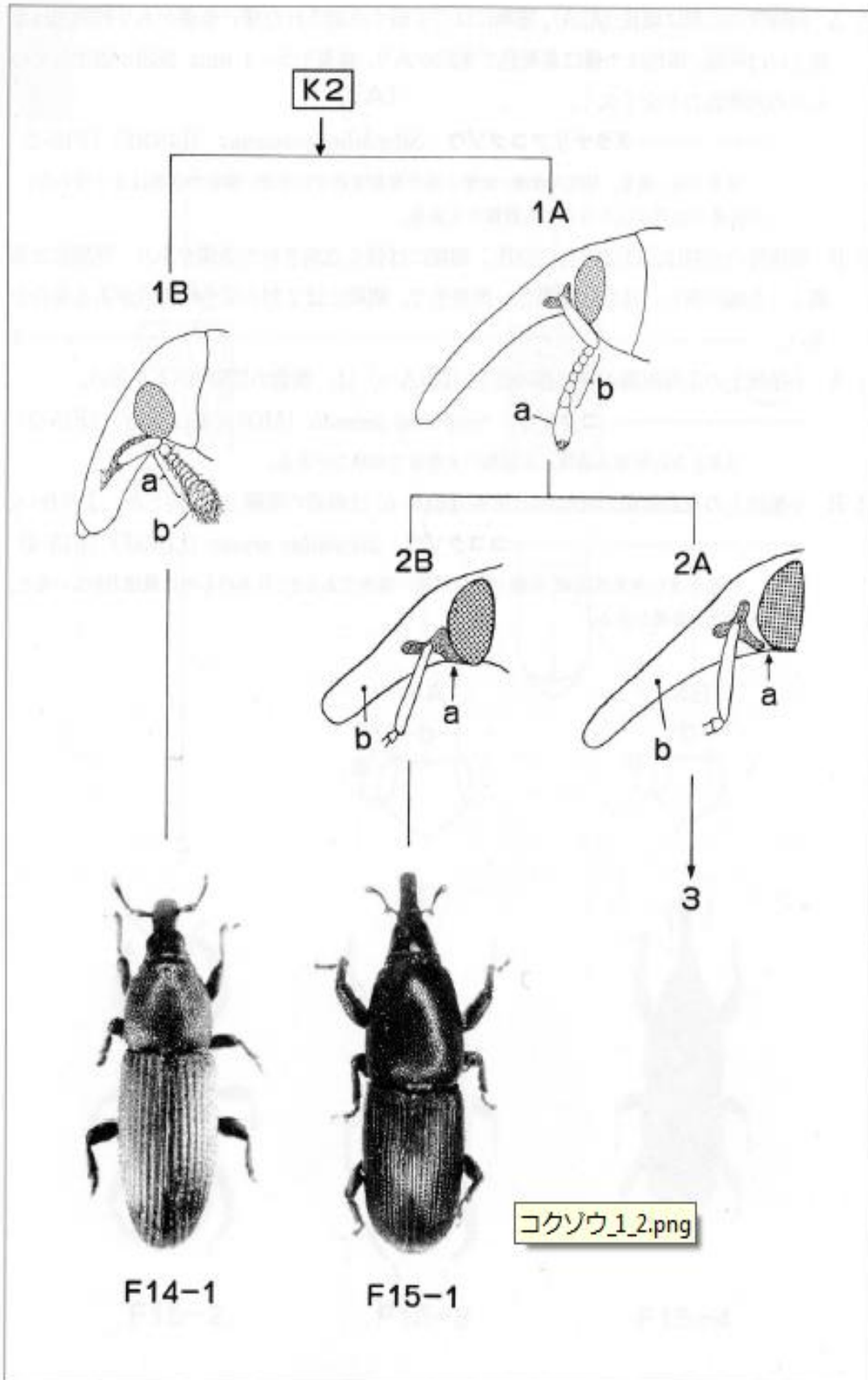
A monotypic genus for *Phylloplatypus padani*  
Maybe in coastal areas in the Philippines

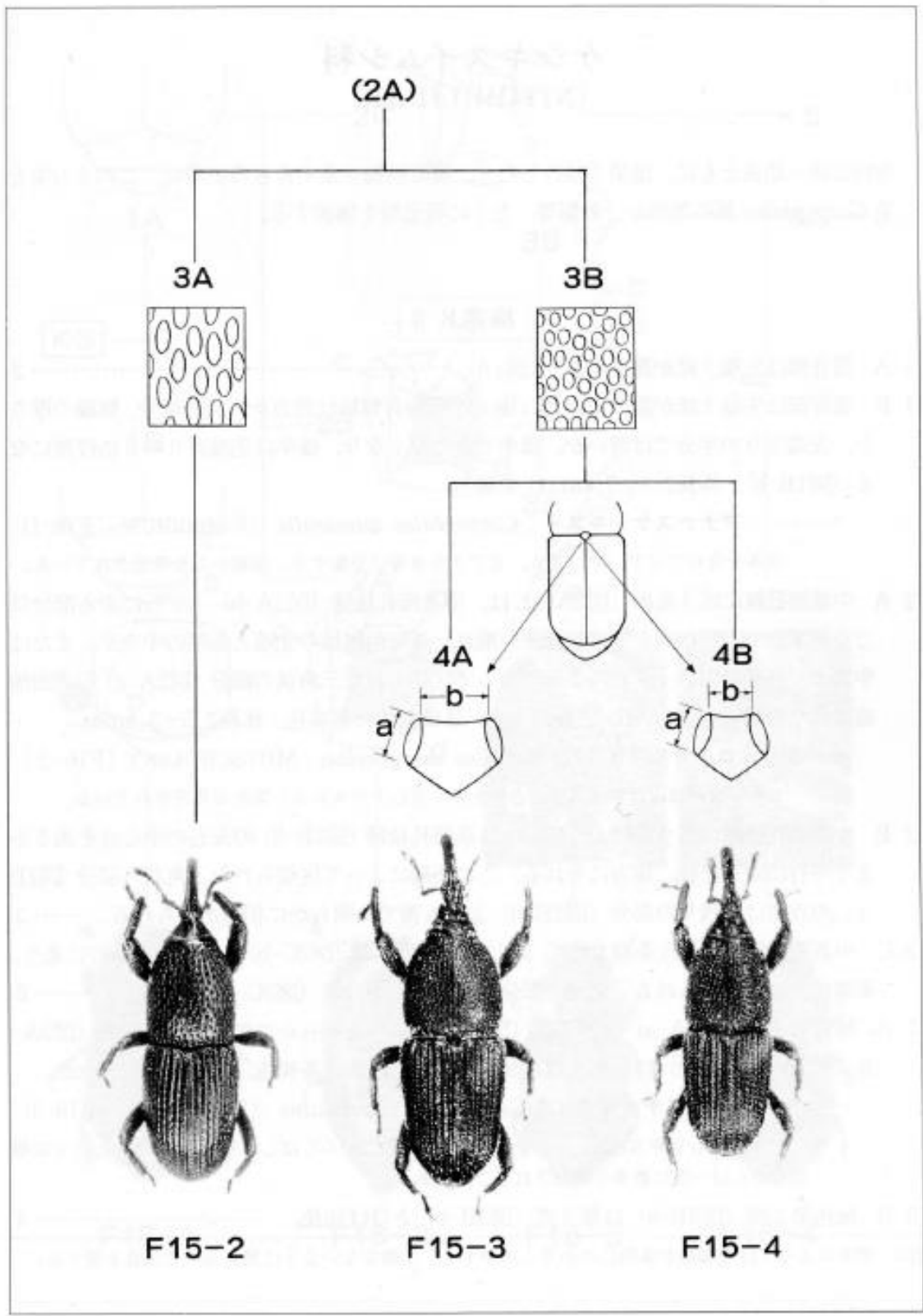
Prothorax with sternal groove. Body not cylindrical.



**Cryptorhynchinae**

Usually on dead trees,  
Many species are attracted by light





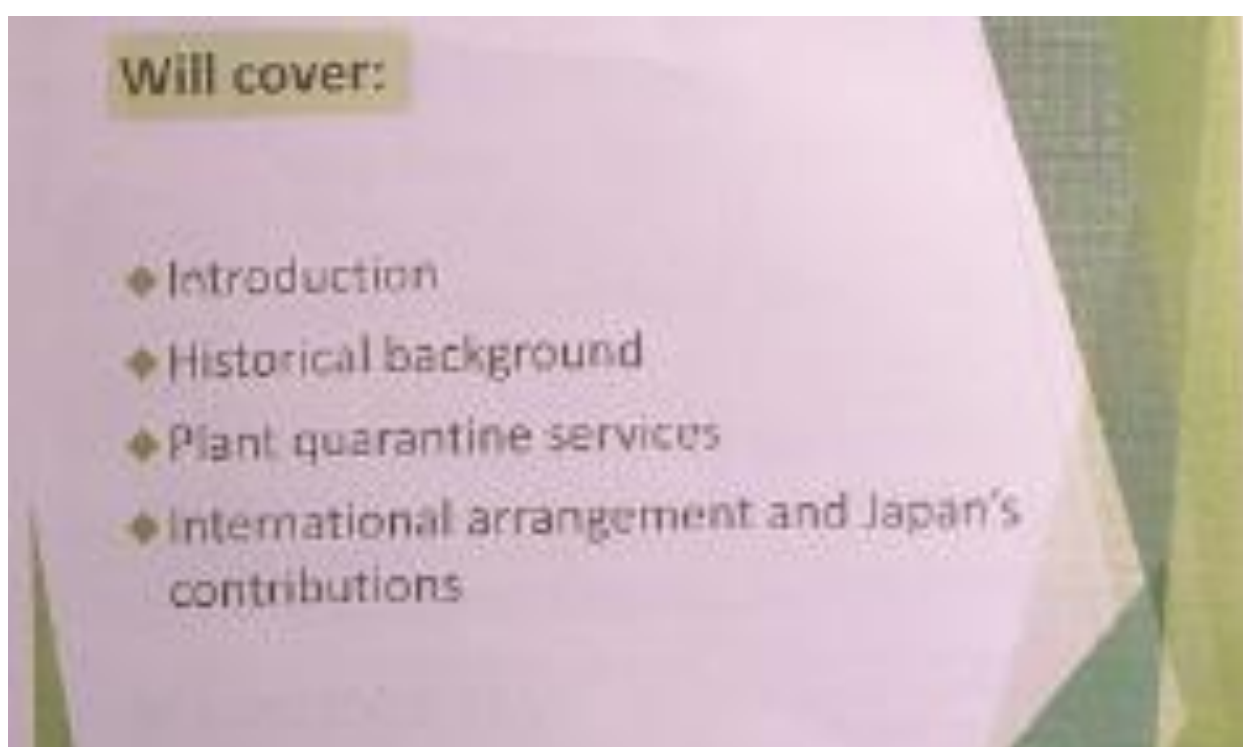
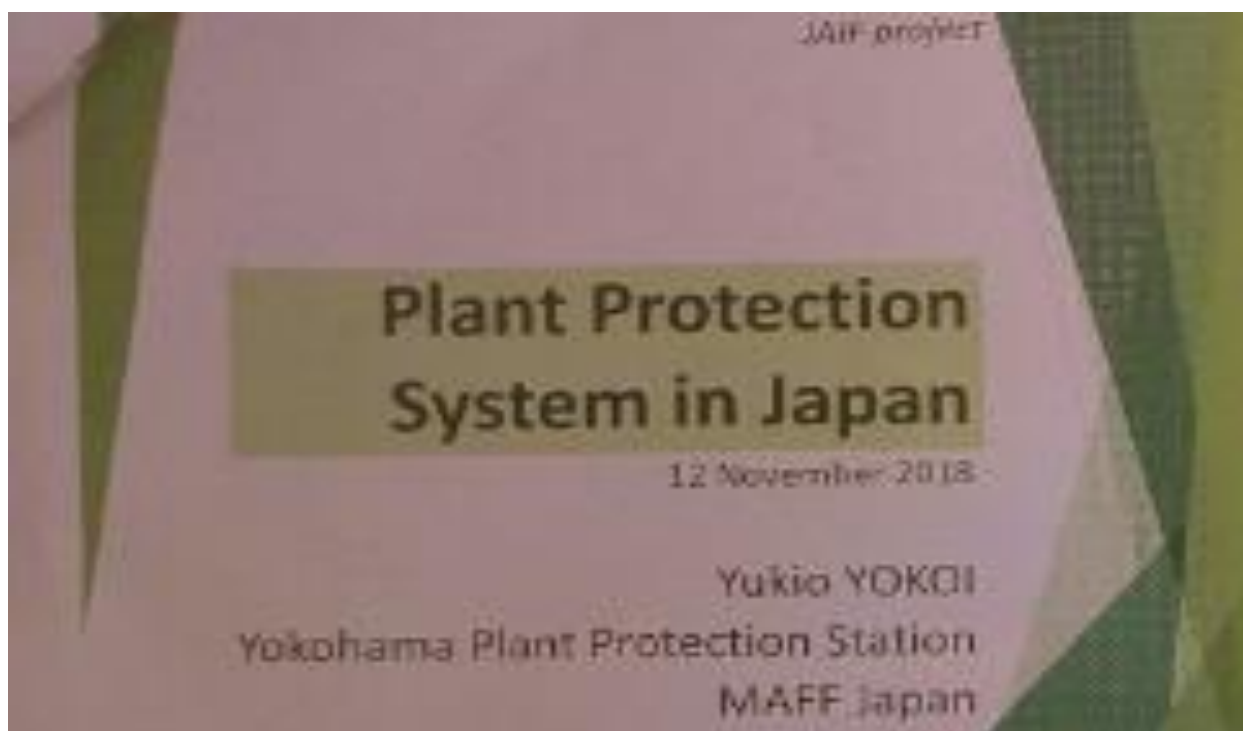
## ANNEXES 3

### PRESENTATION RELATED TO PLANT QUARANTINE STATION

Presented by:

**Yukio Yokoi**

**(Ministry of Agriculture, Forestry, and Fisheries of Japan)**



## What happened to France in late 1850s



Phylloxera in Meyers  
Lexikon (1888)



Phylloxera (left) and their galls (right)  
Copyright: EPPO Gallery

Phylloxera, *Daktulosphaira vitifoliae* (= *Viteus vitifoliae*), introduced from US to Europe

## Japan's case



### Particular aspects to affect plant quarantine

#### Geographic

- island – pests do not come across land border (but by flying, winds, trade, travelers, ...)
- Relatively easy to protect?
- Introduction and spread of new pests can cause serious damage

#### Climate

- North-south long over different climatic zones (subarctic – temperate – subtropics)
- Wide-range of plants to be protected
- In-country quarantine needed

#### Economy (agriculture, trade, etc.)

- Wide-range of crops
- Large volume of trade & consumption, many visitors
- Wide-variety of concerns
- High risk of pest introduction
- High impacts by "stop" of trade

#### Others

- Isolation policy over more than 300 years
- Specific ecological situations remained for long-time without external impacts



## Challenges

1. Increasing risks of pest introduction (and spread)
  - Rapid changes of trade (quantity and variety)
  - development of logistics
  - **More focused/reinforced plant quarantine!**

## Agricultural trade



## In-coming travelers



## Challenges

### 2. International harmonization

"phytosanitary measures should not be applied in such a way as to constitute either a means of arbitrary or unjustified discrimination or disguised restriction" (Preamble, IPPC) + WTO/SPS

→ Quarantine pests clearly listed, measures based on PRA!

## Revision of plant quarantine (2011)

before



after



※By using scientific name

★ <http://www.maff.go.jp/syouan/keneki/kikaku/english-ver.html>

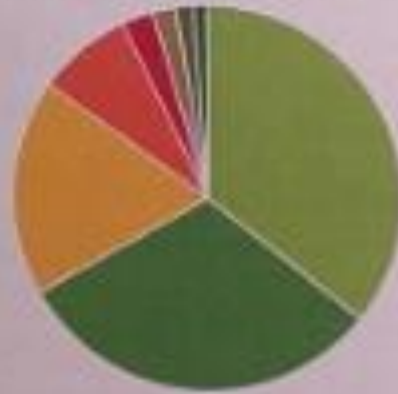
## PLANT QUARANTINE SERVICE



## IMPORT QUARANTINE PROCEDURES 1



## Pest insects found in vegetables (cargo)



- Hemiptera
- Lepidoptera
- Thysanoptera
- Diptera
- Acari
- Symphyla
- Collembola
- Others

## Pest insects found in fruits (cargo)



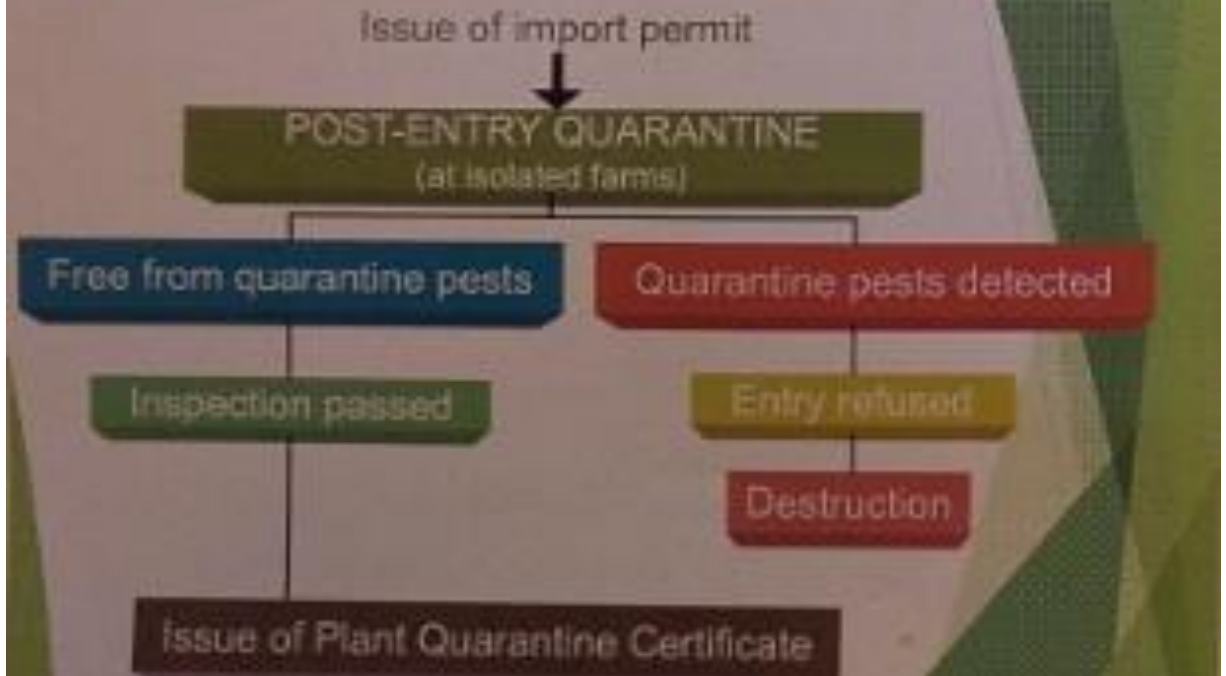
- Hemiptera
- Others

Plant quarantine statistics (2007-2016)

## DISINFESTATION

METHOD	
Chemical treatment (Fumigation)	Hydrogen cyanide (HCN) <b>Methyl bromide (CH<sub>3</sub>Br) --- &gt; ?</b> Aluminum phosphide (AlP <sub>2</sub> S <sub>6</sub> -- > PH <sub>3</sub> ) Carbon dioxide (CO <sub>2</sub> ) Gas mixture (CH <sub>3</sub> Br, PH <sub>3</sub> , CO <sub>2</sub> )
Physical treatment	Hot water treatment Dry heat treatment Vapor heat treatment Cold treatment
Others	<b>Irradiation &lt; - - not applied in Japan</b>

## IMPORT QUARANTINE PROCEDURES 2a



## IMPORT BAN LIFTING (procedure)



## EXPORT QUARANTINE

Knowledge base of other countries' requirements is essential!!



Export inspection of Bonsai trees bound for EU

## PLANT QUARANTINE SERVICE



## Emergency actions

- 1965-69, Sweet potato weevil (Satsuma Peninsula, Kagoshima)
- 1967-69, Burrowing nematode *Radopholus similis* (Hachijoujima, Tokyo)
- 1991-98, Sweet potato weevil (Tanegashima is., Kagoshima)
- 1995, Sweet potato weevil (Satsuma Peninsula, Kagoshima)
- 1996-98, Sweet potato weevil (Muroto city, Kochi)
- 1998-2000, Sweet potato weevil (Yakushima is., Kagoshima)
- 1998-04, West Indian sweet potato weevil (Yakushima is., Kagoshima)
- 2007-12, Citrus greening disease (Kikaijima is., Kagoshima)
- 2009-12, Sweet potato weevil and West Indian sweet potato weevil (Satsuma Peninsula, Kagoshima)
- 2010-, Plum Pox Virus (Ome city, Tokyo and others)

## TRAINING



Plant Quarantine Training Center (Yokohama)




Pest identification



English communication

**PRESENTATIONS OF PARTICIPANT**


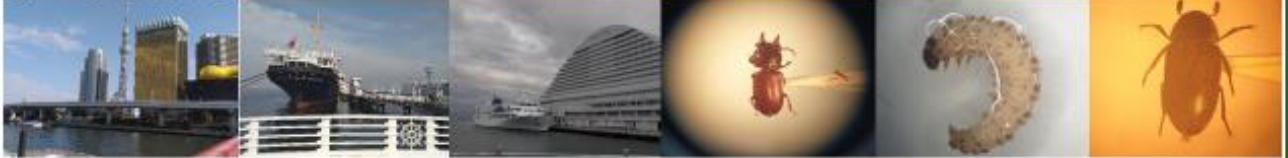

Presented by:  
**Kemas Usman**  
at Kobe Plant Protection Station



**ATTACHMENT PROGRAM:  
WEEVILS OF QUARANTINE IMPORTANCE WITH SPECIAL  
EMPHASIS ON STORED PRODUCT  
INSECT PESTS**

JAIF Funded Project on Taxonomic Capacity Building to Support Market Access  
for Agricultural Trade in The Asean Region

**KEMAS USMAN**  
(INDONESIAN AGRICULTURAL QUARANTINE AGENCY)  
22<sup>nd</sup> November 2018



**OVERVIEW**

- 1 INTRODUCTION**
  - BACKGROUND INFORMATION
  - OBJECTIVE OF THE ATTACHMENT
- 2 DAILY ACTIVITIES**
  - LABORATORY STUDIES
  - FIELD VISIT
  - SPECIMEN COLLECTION STUDIES
  - OTHER ACTIVITIES
- 3 SUMMARY**



## INTRODUCTION

### BACKGROUND INFORMATION



The ASEAN Plant Health Cooperation Network (APHCN) - ASEANET Project "Taxonomic capacity building to support market access for agricultural trade in the ASEAN region", funded by the Japan ASEAN Integration Fund (JAIF)



"Training Workshop on Diagnostics of Weevils of Quarantine Importance" successfully held from 10 to 22 July 2017 at Institute of Weed Science, Entomology and Plant Pathology, University of the Philippines Los Baños, Los Baños, Laguna, Philippines

weevils are small to medium insects that belongs to Order Coleoptera and many are considered as pests of crops or stored products



Attachment training program Phase 2 - "Weevils of Quarantine Importance with Special Emphasis on Stored Product Insect Pests" held from 17 November to 19 December 2018 at Japan



## INTRODUCTION

### OBJECTIVE OF THE ATTACHMENT



Transfer skills and knowledge of weevil experts specifically Japanese experts in the diagnostics and identification

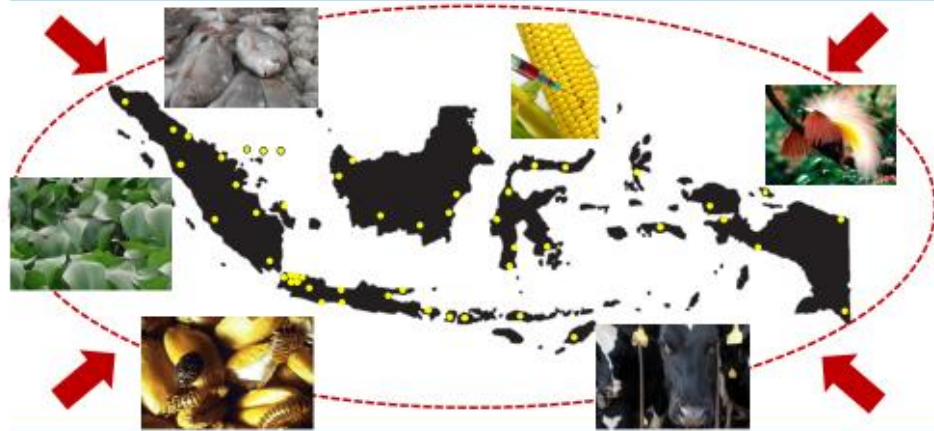


Strengthen the diagnostic capacity by providing participants with practical understanding of the concept of weevils, their identification and current management practices; and



Tap these trained participants more intensive technical training and subsequently serve as potential ASEAN resource persons on the identification of weevils

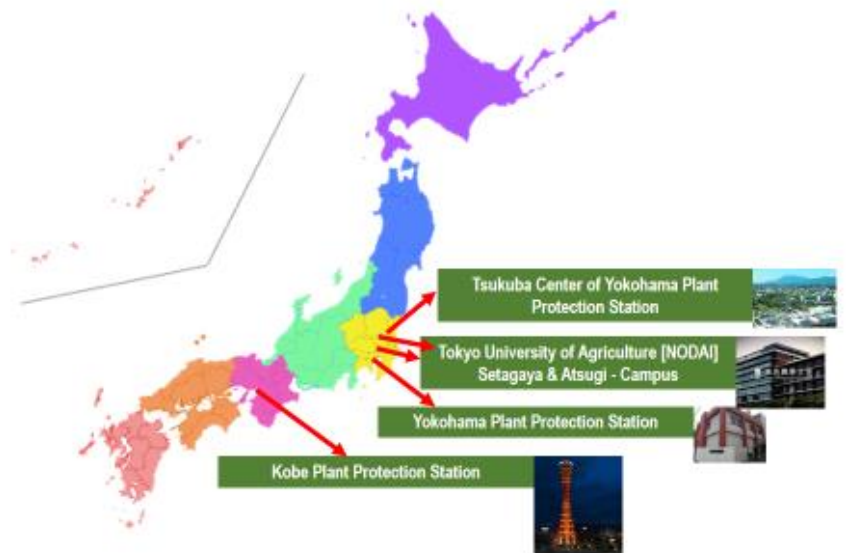
ARCHIPELAGO COUNTRY WITH MANY ENTRY POINTS HAVE HIGH RISK OF QUARANTINE PESTS AND BIODIVERSITY THREAT ENTRY INTO TERRITORY



50 Agricultural  
Quarantine  
Services/Stations

783 Exit/Entry Point

### TRAINING LOCATIONS



## DAILY ACTIVITIES

### FIELD TRIP & SIGHTSEEING AROUND TOKYO

- ✓ Held on 9-11 November 2018
  - 9 November 2018: Miraikan Museum
  - 10 November 2018: Tama Zoo
  - 11 November 2018: Tokyo City



## DAILY ACTIVITIES

### YOKOHAMA PLANT PROTECTION STATION

- ✓ Held on 12-17 November 2018
  - ✓ Briefing and orientation of Yokohama Plant Protection Station
  - ✓ Presentation and Introduction of:
    - Plant Protection System in Japan,
    - International/Regional Arrangements and Japan contributions (SPS Agreement, IPPC, APPPC, etc.)
    - Yokohama Plant Protection Station (Structure of Organization, facilities, human resources, laboratory, specimen collections, research activities by Entomology Section, etc.)
  - ✓ Lecture and Practices of Storage Pests in the Laboratory:
    - Identification of adult Coleoptera (as storage pest)
    - Identification of adult in family Dermestidae (as storage pests)
    - Identification of larvae Lepidoptera (as storage pest)
    - Identification of adult Lepidoptera (as storage pest) with observation genitalia
- 
- By morphological characters using identification key
- ✓ Lecture of:
    - Simple wing-spreading for voucher specimen (for adult of Lepidoptera),
    - Procedure of preparation for wing spreading (for adult of Lepidoptera),
    - Preparation and dissection genitalia structure of adult of Lepidoptera

## DAILY ACTIVITIES

### YOKOHAMA PLANT PROTECTION STATION

NO.	ACTIVITY	RESULT
1.	Identification of some families in Coleoptera Instructor: Mr. Masumoto Masami (Yokohama Plant Protection Station)	<ul style="list-style-type: none"> <li>• S.F. Bostrychoidea: Anobiidae, Bostrichidae, Ptinidae</li> <li>• S.F. Cleroidea: Cleridae, Trogossitidae</li> <li>• S.F. Chrysomeloidea: Bruchidae</li> <li>• S.F. Curculionoidea: Anthribidae, Dryophthoridae</li> <li>• S.F. Cucujoidea: Cerylonidae, Lathriidae, Silvanidae, Tenebrionidae</li> <li>• S.F. Dermestoidea: Dermestidae</li> </ul>
2.	Identification of some species in Dermestidae Instructor: Mr. Masumoto Masami (Yokohama Plant Protection Station)	<ul style="list-style-type: none"> <li>• <i>Anthrrenus verbasci</i>,</li> <li>• <i>Attagenus</i> sp.,</li> <li>• <i>Dermestes ater</i>,</li> <li>• <i>Dermestes frischii</i>,</li> <li>• <i>Dermestes haemorrhoidalis</i>,</li> <li>• <i>Dermestes maculatus</i>,</li> <li>• <i>Trogoderma glabrum</i>,</li> <li>• <i>Trogoderma granarium</i>,</li> <li>• <i>Trogoderma variabile</i>, and</li> <li>• <i>Trogoderma varium</i>.</li> </ul>

## DAILY ACTIVITIES

### YOKOHAMA PLANT PROTECTION STATION

NO.	ACTIVITY	RESULT
3.	Identification of larvae in Lepidoptera Instructor: Mr. Higo Yuichi (Yokohama Plant Protection Station)	<p><b>Basic knowledge of morphological characters</b></p> <ul style="list-style-type: none"> <li>• <i>Helicoverpa armigera</i> (Lepidoptera: Noctuidae),</li> <li>• Larvae of family Heliiothinae, and</li> <li>• <i>Carposina sasakii</i> (Lepidoptera: Carposinidae).</li> </ul> <p><b>Identification of larva Lepidoptera (as storage pests)</b> <i>Plodia interpunctella</i>, <i>Corcyra cephalonica</i>, <i>Cadra cautella</i>, <i>Cydia pomonella</i>, <i>Ephestia kuehniella</i>, <i>Pyralis farinalis</i>, <i>Sitotroga cerealella</i>, <i>Parailpsa gularis</i>, and <i>Helicoverpa armigera</i>.</p>
4.	Identification of imago in Lepidoptera Instructor: Mr. Higo Yuichi (Yokohama Plant Protection Station)	<p><b>Basic knowledge of morphological characters</b></p> <ul style="list-style-type: none"> <li>• <i>Helicoverpa armigera</i> (Lepidoptera: Noctuidae) ♂ and ♀, and</li> <li>• <i>Spodoptera litura</i> (Lepidoptera: Noctuidae) ♂ and ♀.</li> </ul> <p><b>Identification of imago Lepidoptera (as storage pests) by genitalia characters</b> <i>Corcyra cephalonica</i> (♂ and ♀), <i>Plodia interpunctella</i> (♂ and ♀), <i>Sitotroga cerealella</i> (♂ and ♀), and <i>Ephestia kuehniella</i> (♂ and ♀).</p>

## DAILY ACTIVITIES

### FIELD TRIP & SIGHTSEEING AROUND YOKOHAMA

✓ Held on 17 November 2018

Sankeien Garden

Cruise travel at Yokohama Port



## DAILY ACTIVITIES

### KOBE PLANT PROTECTION STATION

✓ Held on 19-22 November 2018

✓ Presentation of Overview of Kobe Plant Protection Station (Structure of Organization, inspection areas in Kobe Port, plant quarantine procedures, facilities, human resources, laboratories, specimen collection, management, etc.)

✓ Identification of storage pests in the laboratory:

- Darkling beetles (as storage pest)
  - Seed beetles (as storage pests)
- By morphological characters using identification key

✓ Field visit to:

- Warehouse at Kamigumi Co., Ltd. in Port Island, and
- Silo at Showa Company

✓ Preparation and presentation of the Attachment Program

## DAILY ACTIVITIES

### KOBE PLANT PROTECTION STATION

NO.	ACTIVITY	RESULT
1.	Identification of Darkling Beetles Instructor: Mr. Tatsuo Matsuda (Kobe Plant Protection Station)	<i>Alphitophagus bifasciatus</i> , <i>Tribolium confusum</i> , <i>Tribolium destructor</i> , <i>Tribolium castaneum</i> , <i>Tribolium madens</i> , <i>Tenebrio molitor</i> , <i>Tenebrio obscurus</i> , <i>Palearctus dermestoides</i> , <i>Alphitobius diaperinus</i> , <i>Alphitobius laevigatus</i> , <i>Palorus ratzeburgi</i> , <i>Palorus cerylonoides</i> , <i>Gnathocerus cornutus</i> , <i>Gnathocerus maxillosus</i> , and <i>Latheticus oryzae</i> .
2.	Identification of Seed Beetles Instructor: Mr. Tatsuo Matsuda (Kobe Plant Protection Station)	<i>Caryedon serratus</i> , <i>Zabrotes subfasciatus</i> , <i>Acanthoscelides obtectus</i> , <i>Bruchus pisorum</i> , <i>Callosobruchus chinensis</i> , and <i>Callosobruchus maculatus</i> .
3.	Field visit to Kamigumi Co., Ltd. In Port Island	Learning about: sampling technique of fresh banana and kiwi fruit at the warehouse, quarantine inspection at warehouse, etc.
4.	Field visit to Silo at Showa Sangyo Company	Learning about: information of sampling technique of grain commodities (wheat, soybean, corn, etc.), quarantine inspection at silo, etc.

## SUMMARY



In general, the Attachment Program in 3 (three) locations [NODAI University, Yokohama Plant Protection Station, and Kobe Plant Protection Station] already running good and satisfying



Participants got a lot of information about the Plant Quarantine System in Japan, identification of some storage insect pests based on morphological characters, operational of Plant Quarantine Station at Yokohama and Kobe, etc.



There are some aspects to be a good references:

- PRA Division in the Organizational Structure of Plant Quarantine in Japan,
- Good facilities in every Plant Quarantine Station, including in Branch and Sub Station,
- Plant quarantine inspection at the port to be more effective and efficiently (checking on the spot)

## PRESENTATIONS OF PARTICIPANT

Presented by:  
**Kemas Usman**  
at Fuji Flavour Co., Ltd.

### INTRODUCTION

**KEMAS USMAN**  
(PLANT QUARANTINE OFFICER - INDONESIA AGRICULTURAL QUARANTINE AGENCY)

**ATTACHMENT PROGRAM:**  
**WEEVILS OF QUARANTINE IMPORTANCE WITH SPECIAL EMPHASIS ON STORED PRODUCT INSECT PESTS**  
JAIF Funded Project on Taxonomic Capacity Building to Support Market Access for Agricultural Trade in The Asean Region

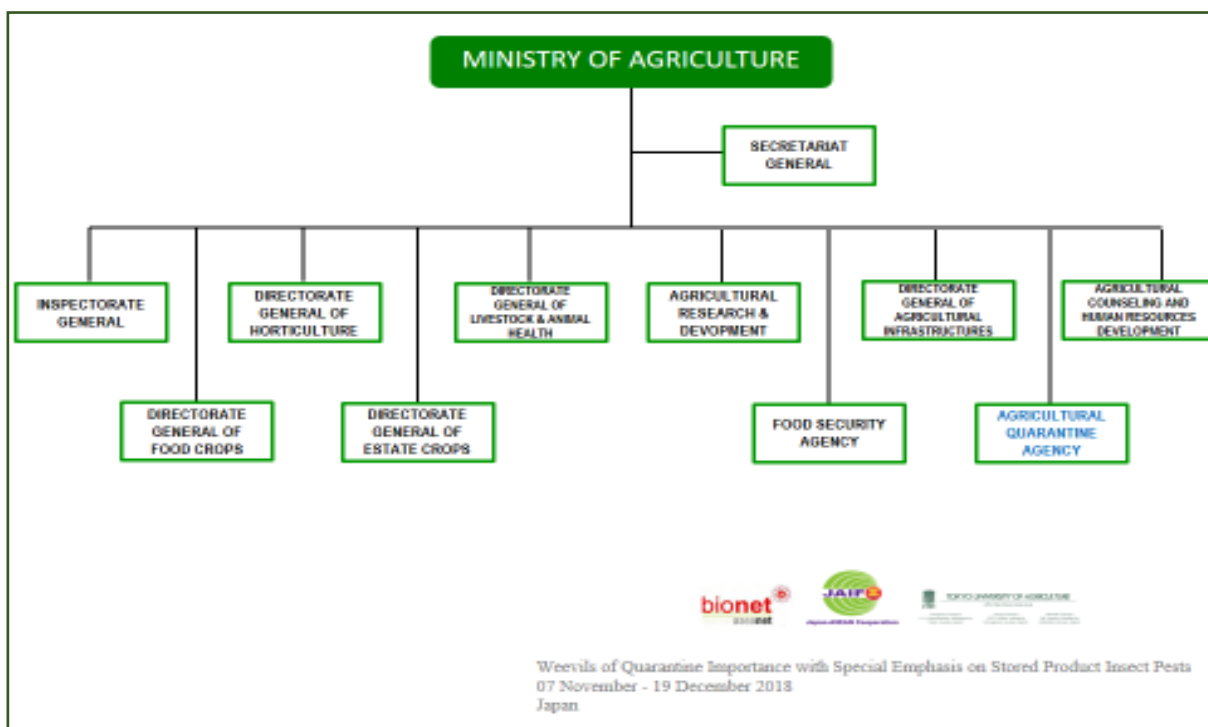
bionet<sup>®</sup> JAIF<sup>®</sup> SOJO UNIVERSITY OF AGRICULTURE

### OUTLINE PERSENTATION

- ORGANIZATIONAL STRUCTURE OF IAQA
- CONCERN WEEVILS FOR IMPORT & EXPORT IN INDONESIA
- ABILITY IN IDENTIFICATION OF WEEVILS SPECIES
- CONCLUSION

bionet<sup>®</sup> JAIF<sup>®</sup> SOJO UNIVERSITY OF AGRICULTURE

Weevils of Quarantine Importance with Special Emphasis on Stored Product Insect Pests  
07 November - 19 December 2013  
Japan



## CONCERN WEEVILS IN INDONESIA

- ❑ Weevils species may attack some commodities: grain/cereal in storage, horticulture, forestry, etc.
- ❑ There are some species of weevils become quarantine pests in the world.



## CONCERN WEEVILS FOR IMPORTATION IN INDONESIA CATEGORY A1

No.	Species
1.	<i>Alcidodes dentipes</i>
2.	<i>Anthonomus grandis</i>
3.	<i>Anthonomus signatus</i>
4.	<i>Anthonomus vestitus</i>
5.	<i>Caulophilus oryzae</i>
6.	<i>Cholus cattleyae</i>
7.	<i>Conotrachelus nenuphar</i>
8.	<i>Cylas puncticollis</i>
9.	<i>Diaprepes abbreviatus</i>
10.	<i>Diorymerellus laevimargo</i>
11.	<i>Euscepes postfasciatus</i>

No.	Species
12.	<i>Listronotus bonariensis</i>
13.	<i>Listronotus oregonensis</i>
14.	<i>Listronotus texanus</i>
15.	<i>Naupactus leucoloma</i>
16.	<i>Nematocerus spp.</i>
17.	<i>Otiorhynchus sulcatus</i>
18.	<i>Pissodes strobi</i>
19.	<i>Rhynchophorus palmarum</i>
20.	<i>Rhynchophorus phoenicis</i>
21.	<i>Sitophilus granarius</i>

Source: MoA Regulation No.31/2018  
Regarding Quarantine Pest List of Indonesia

## CONCERN WEEVILS FOR IMPORTATION IN INDONESIA CATEGORY A2

No.	Species
1.	<i>Acanthoscelides obtectus</i>
2.	<i>Rhabdoscelus obscurus</i>



Source: MoA Regulation No.31/2018  
Regarding Quarantine Pest List of Indonesia

## Interception of *Sitophilus granarius* (Category A1) in wheat importation from Ukraine through the Sea Port of Cilegon



Adult without membranous wings



Oval shape Puncture in thorax



Elytra without spot



Comparison of adult *Sitophilus zeamays* (above) and *S. granarius* (below)



Short aedeagus



### EMERGENCY ACTION:

#### FUMIGATION

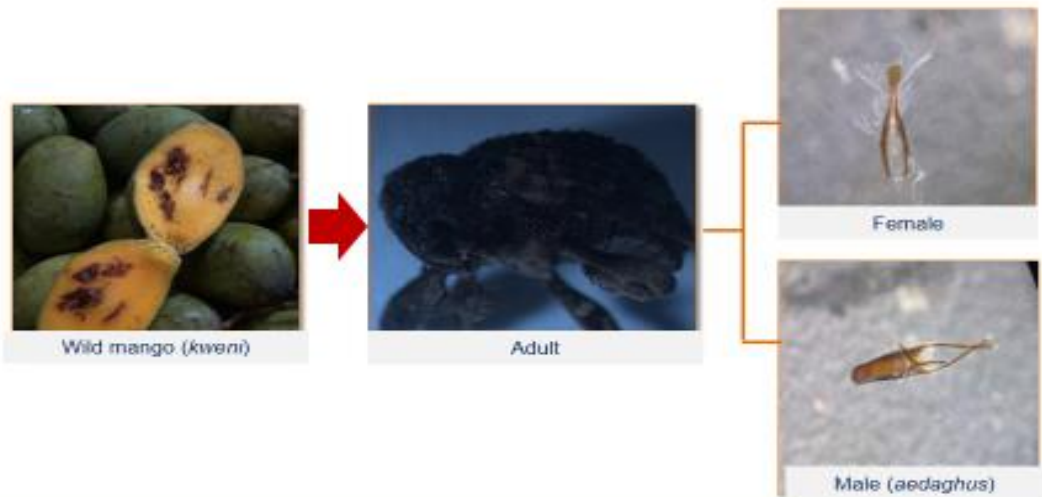
- Methyl Bromide fumigation dose 48 g/m<sup>3</sup> for 3x24 h on temperature above 20 °C
- Fosfin fumigation dose 3 gr/m<sup>3</sup> for 96 h

IDENTIFICATION BY MORPHOLOGICAL CHARACTERISTICS

## Identification of mango pulp weevil *Sternochetus frigidus*

Source:

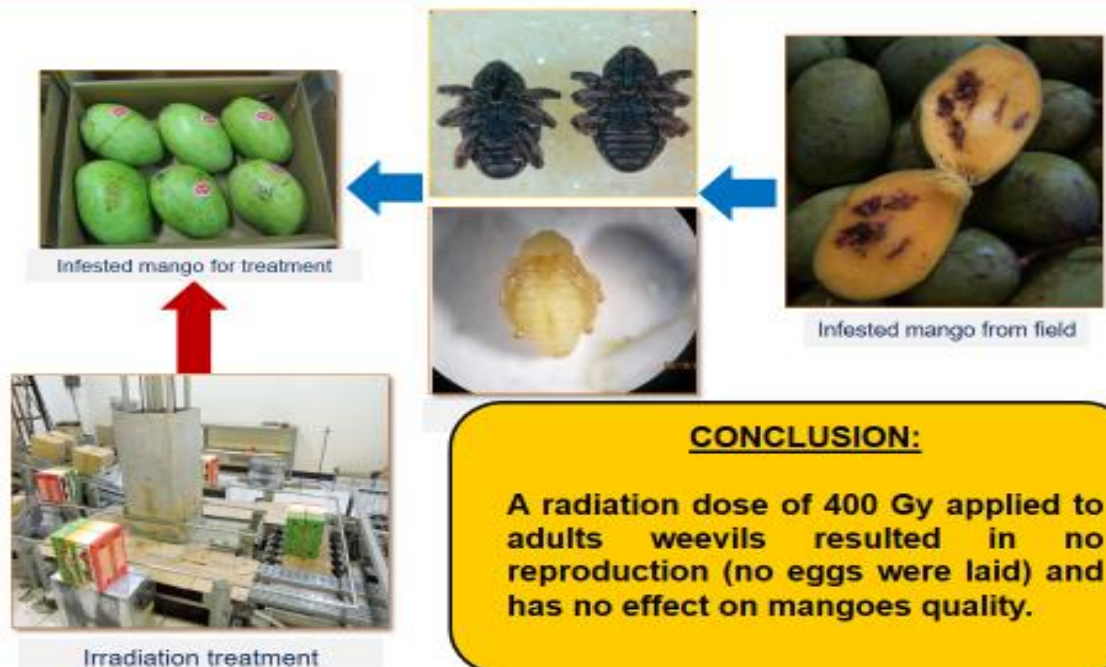
Applied Research Institute of Agricultural Quarantine (ARIAQ)



IDENTIFICATION BY MORPHOLOGICAL CHARACTERISTICS

Source:

Applied Research Institute of Agricultural Quarantine (ARIAQ)



## ABILITY IN IDENTIFICATION OF WEEVILS SPECIES

- ❑ Generally, a plant quarantine officers in Indonesia has skills in identification of weevils species .
- ❑ But, still needed skills improvement, especially in molecular identification method and increase the number of human resources who have ability in identification methods.
- ❑ Actually, the human resources who have a skill in identifying of some weevils species are come from : (1) Plant quarantine officer ; (2) Academic institution.
- ❑ Currently, the research related to the identification of weevils species is still limited (dominant in aspect of mortality or effect of the treatment)

## CONCLUSION

- ❑ Indonesia still need a capacity building/technical assistance in identifying of weevils species related to quarantine importance (morphological and biomolecular methodology).
- ❑ **Training Workshop on Diagnostics of Weevils of Quarantine Importance** will be useful for Indonesia Agricultural Quarantine.



Weevils of Quarantine Importance with Special Emphasis on Stored Product Insect Pests  
07 November - 19 December 2018  
Japan

## FINAL PRESENTATIONS OF PARTICIPANT

Presented by:  
**Kemas Usman**  
 at Tokyo University of Agriculture

**Attachment Program:**  
**WEEVILS OF QUARANTINE IMPORTANCE WITH SPECIAL EMPHASIS ON STORED PRODUCT INSECT PESTS**

**Kemas Usman**  
 Plant Quarantine Officer - Indonesian Agricultural Quarantine Agency  
 (Presented in NODAI - Setagaya Campus, Japan, 17 December 2018)

Logos: bionet, JAIF, TOKYO UNIVERSITY OF AGRICULTURE

Vertical strip on the left: SETAGAYA, YOKOHAMA, KOBE, BE-KOBE, TSUKUBA, ATSUJI

Horizontal strip at the bottom: Images of weevils, a laboratory setting, and a display case.

## INTRODUCTION

**Central Sulawesi (2009-2011)**  
 • PQ Officer at Airport, Seaport, and Laboratory

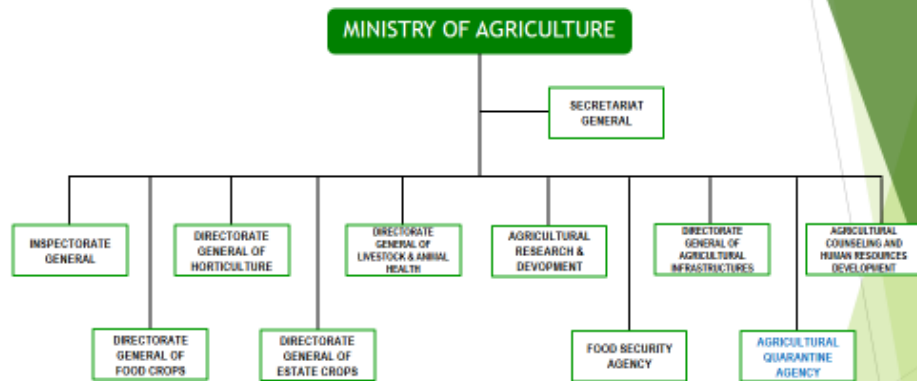
**ARIAG (2011-2015)**

**Head Office (2015-present)**

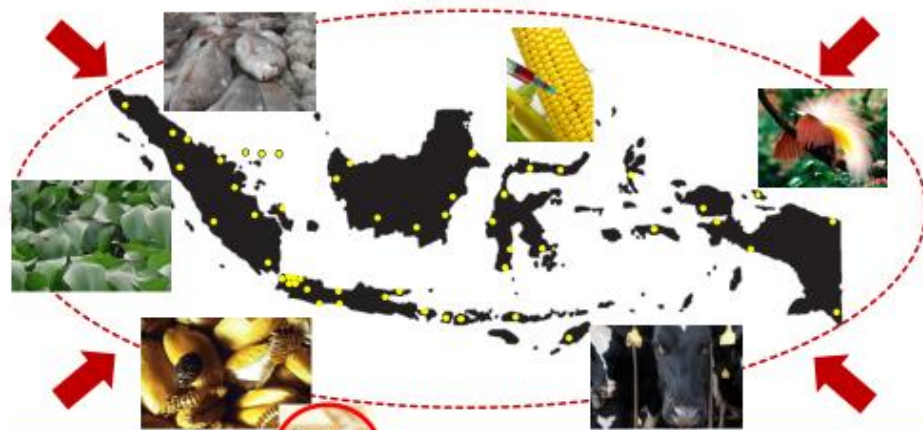
- Technical & administrative
- PRA
- Diagnostic protocol
- ISPM
- SPS Draft Text
- PQ training curriculum
- Teaching Assistant (Basic Entomology, mites)
- Teaching (X-ray machine, wood packaging pests, SPS Agreement)

Technical & administrative  
 Laboratory activities (quarantine treatment, etc.)  
 Teaching Assistant (Basic Entomology, mites)  
 Teaching (X-ray machine)

# INTRODUCTION



## ARCHIPELAGO COUNTRY WITH MANY ENTRY POINTS HAVE HIGH RISK OF QUARANTINE PESTS AND BIODIVERSITY THREAT ENTRY INTO TERRITORIAL



52 Work Stations  
- 1 Head Office  
- 49 Technical Work Station  
- 1 Center of Diagnostic Standard Agricultural Quarantine  
- 1 Applied Research Institute of Agricultural Quarantine

783 Exit/Entry Point

## CONCERN WEEVILS FOR IMPORTATION IN INDONESIA

### CATEGORY A1

No.	Species	No.	Species
1.	<i>Alcidodes dentipes</i>	12.	<i>Listronotus bonariensis</i>
2.	<i>Anthonomus grandis</i>	13.	<i>Listronotus oregonensis</i>
3.	<i>Anthonomus signatus</i>	14.	<i>Listronotus texanus</i>
4.	<i>Anthonomus vestitus</i>	15.	<i>Naupactus leucoloma</i>
5.	<i>Caulophilus oryzae</i>	16.	<i>Otiorhynchus sulcatus</i>
6.	<i>Cholus cattleyae</i>	17.	<i>Pissodes strobi</i>
7.	<i>Conotrachelus nenuphar</i>	18.	<i>Rhynchophorus palmarum</i>
8.	<i>Cylas puncticollis</i>	19.	<i>Rhynchophorus phoenicis</i>
9.	<i>Diaprepes abbreviatus</i>	20.	<i>Sitophilus granarius</i>
10.	<i>Diorymerellus laevimargo</i>	21.	<i>Trogoderma granarium</i>
11.	<i>Euscepes postfasciatus</i>		

### CATEGORY A2

No.	Species
1.	<i>Acanthoscelides obtectus</i>
2.	<i>Rhabdoscelus obscurus</i>



Source: MoA Regulation No.31/2018  
Regarding Quarantine Pest List of Indonesia

## INTRODUCTION

### BACKGROUND INFORMATION

- The ASEAN Plant Health Cooperation Network (APHCN) - ASEANET Project "Taxonomic capacity building to support market access for agricultural trade in the ASEAN region", funded by the Japan ASEAN Integration Fund (JAIF)
- "Training Workshop on Diagnostics of Weevils of Quarantine Importance" successfully held from 10 to 22 July 2017 at Institute of Weed Science, Entomology and Plant Pathology, University of the Philippines Los Baños, Los Baños, Laguna, Philippines
- weevils are small to medium insects that belongs to Order Coleoptera and many are considered as pests of crops or stored products
- Attachment training program Phase 2 - "Weevils of Quarantine Importance with Special Emphasis on Stored Product Insect Pests" held from 17 November to 19 December 2018 at Japan

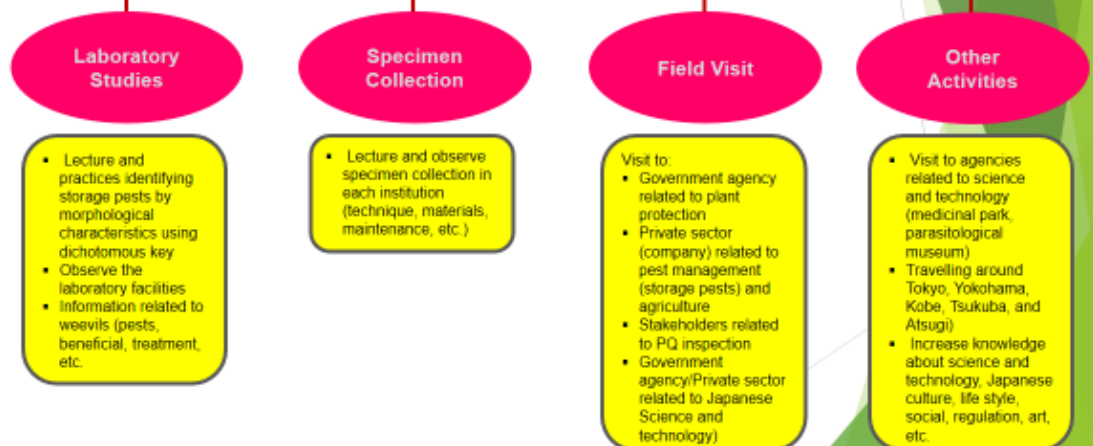


# INTRODUCTION

## OBJECTIVE OF THE ATTACHMENT

- ✓ Transfer skills and knowledge of weevil experts specifically Japanese experts in the diagnostics and identification
- ✓ Strengthen the diagnostic capacity by providing participants with practical understanding of the concept of weevils, their identification and current management practices; and
- ✓ Tap these trained participants more intensive technical training and subsequently serve as potential ASEAN resource persons on the identification of weevils

## DAILY ACTIVITIES



## DAILY ACTIVITIES ON TSUKUBA

Held on 26-30 November 2018

### 1 VISIT TO TSUKUBA AGRICULTURE RESEARCH HALL

- Showcases the research work in agriculture, forestry and fisheries that is carried out by National Research and Development Agency, including the National Agriculture and Food Research Organization (NARO)

### 2 VISIT TO TSUKUBA CENTER OF YOKOHAMA PPS

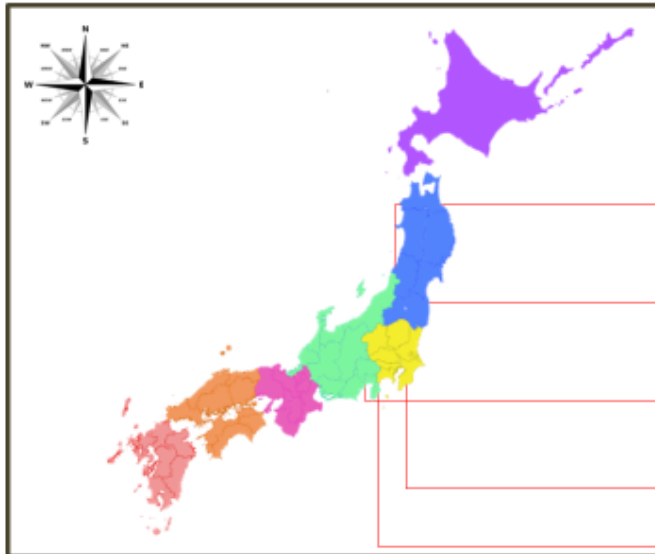
- Presentation of Overview of Tsukuba Center of Yokohama Plant Protection and Post entry quarantine activities
- Observe post entry quarantine facilities (laboratories, green house, etc.)

### 3 VISIT TO TSUKUBA BOTANICAL GARDEN

- Major botanical garden broadly about 14 hectares located in Tsukuba (one of Japan's foremost botanical research facilities and provides public education) which currently contains of domestic and exotic plants

*CONTINUE .....*

## TRAINING LOCATIONS



1. Tokyo University of Agriculture [NODAI]  
Setagaya - Campus



2. Yokohama Plant Protection Station



3. Kobe Plant Protection Station



4. Tsukuba



5. Tokyo University of Agriculture [NODAI]  
Atsugi - Campus



## DAILY ACTIVITIES ON TSUKUBA

Held on 26-30 November 2018

### 4 VISIT TO FOOD ENTOMOLOGY LABORATORY, NARO

- Overview of NARO especially Food Entomology Unit on Division of Food Safety
- Observe Food Entomology Unit on Division of Food Safety facilities (laboratories, treatment facilities) and discussion

### 5 VISIT TO NISSAN CHEMICAL CORPORATION

- Presentation of overview of Nissan Chemical Company and observe laboratories, green house, experiments field, etc.

### 6 VISIT TO ANA FRESH FOOD COMPANY

- Company that have some business scopes (fresh food business, processed food, food export, etc). The main imported fruits which handle by this company: bananas from the Philippines and bananas from Ecuador

## Tsukuba Center of Yokohama PPS

### What have I learned from Tsukuba Center of Yokohama PPS?



#### ► Overview

##### - Post entry quarantine station

(Tsukuba and Kobe receive all post entry goods)

##### - Quarantine methods

(Observation of symptoms, Bioassay (indicator plants, serological (ELISA), molecular (PCR and RT PCR), TEM) – observation of virus shape)

## Overview

one division in NARO which develop some techniques related to treatment of stored product insect, monitoring of stored product insect using traps, identification for insect using DNA analysis, growth parameters of insects of food products for estimating the timing of contamination and various physical and chemical parameters for detecting or discriminating food insect pests.

- ▶ - Control method research  
(Fumigation, High and low temperature, CO<sub>2</sub>)
- Insect rearing room  
(30°C, 75% humidity, light: dark 8:16 hrs.)
- Pheromone trap
- Identification  
(Morphology and Molecular Biology)



## Overview

Tsukuba Agriculture Research Hall showcases the research work in agriculture, forestry and fisheries that is carried out by National Research and Development Agency, including the National Agriculture and Food Research Organization (NARO).

- ▶ Participants got more information about the importance of food and agricultural research in Japan through exhibition panels illustrate and also display of the many tools that have been used during the history of Japanese agriculture.



## Overview

This company is working proactively on 'discovery and development' of new agents for major crops in Japan and overseas.

- ▶ - Research  
(Biological, Chemical and Materials)
- Residual Analysis Laboratory  
(Herbicide, Fungicide, Pesticide and Side effect with water living organisms)
- Equipment and Facilities  
(HPLC, Extraction, Incubation room)



## Overview

Company which have some business scopes, there are: fresh food business, processed food, food export, etc. The main imported fruits which handle by this company: bananas from the Philippines and bananas from Ecuador.

- ▶ - Background  
(History, Business and Their products)
- Conditions, Chambers Management  
(Temperature control and adjust procedure methods)
- Solve problems  
(Optimize condition, pathogen issues)



## SUMMARY

1. In general, the Attachment Program in 5 (five) locations [NODAI-Setagaya, Yokohama Plant Protection Station, Kobe Plant Protection Station, Tsukuba, and NODAI-Atsugi] already running good and satisfying
2. Participants got a lot of information about the systematica classification of weevils, identification of some storage insect pests based on morphological characters (esp. identifying in Family and Sub Family level)
3. Participants got a lot of information about the Plant Quarantine System in Japan and operational of Plant Quarantine Station at Yokohama, Kobe, and Tsukuba
4. Participants have a new experiences related to science and technology, social, cultural, art, and tourism in Japan.
5. There are some aspects to be a good references:
  - PRA Division in the Organizational Structure of Plant Quarantine in Japan
  - Good facilities in every laboratory, including in Academy (University), Government agency (PPS), etc.
  - Good facilities in every Plant Quarantine Station, including in Branch and Sub Station
  - Plant quarantine inspection at the port to be more effective and efficiently (checking on the spot)
  - Build networking with the Japanese Coleopteran expert
  - Build networking with the Japanese experts in food and agricultural
  - Build networking with the private sector related to pest monitoring

## 9. IMAGES/PHOTOS

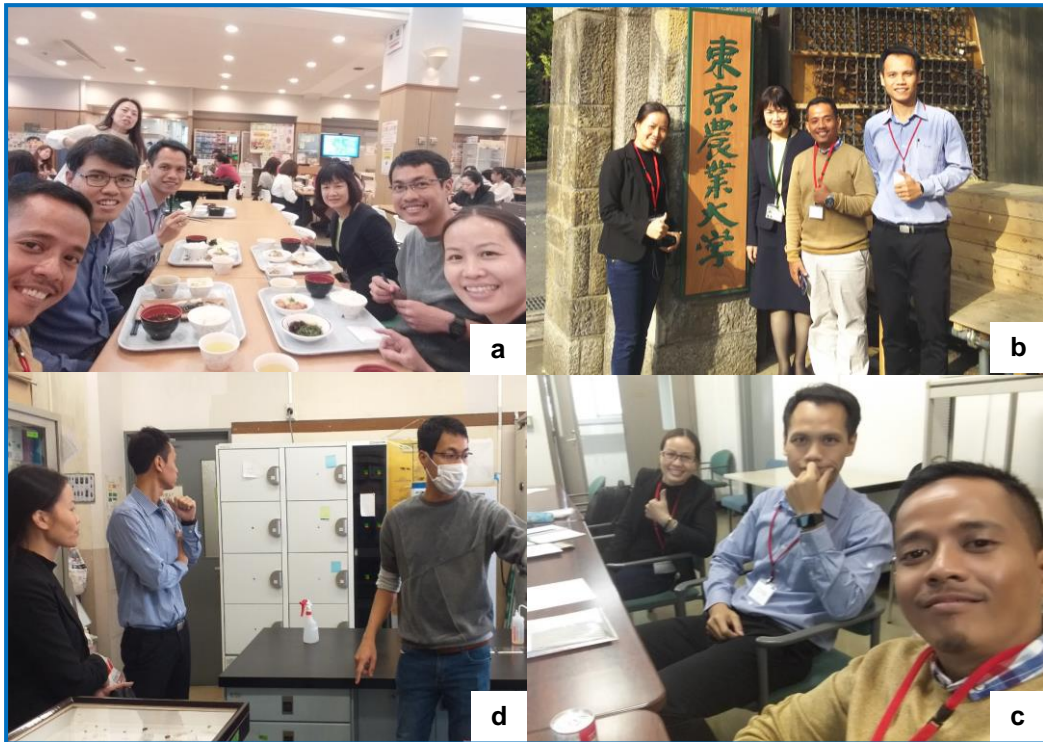


Fig. 1 Briefing and orientation in Tokyo University of Agriculture (NODAI) - Setagaya: (a) lunch at Cafeteria; (b) foto session at the NODAI gate; (c) briefing in meeting room; and (d) orientation of the NODAI laboratories



Fig. 2 Main activities at Yokohama Plant Protection Station: (a) briefing and orientation; (b) laboratory activities; (c) Instructor in identification of Coleoptera; and (d) Instructor in identification of Lepidoptera

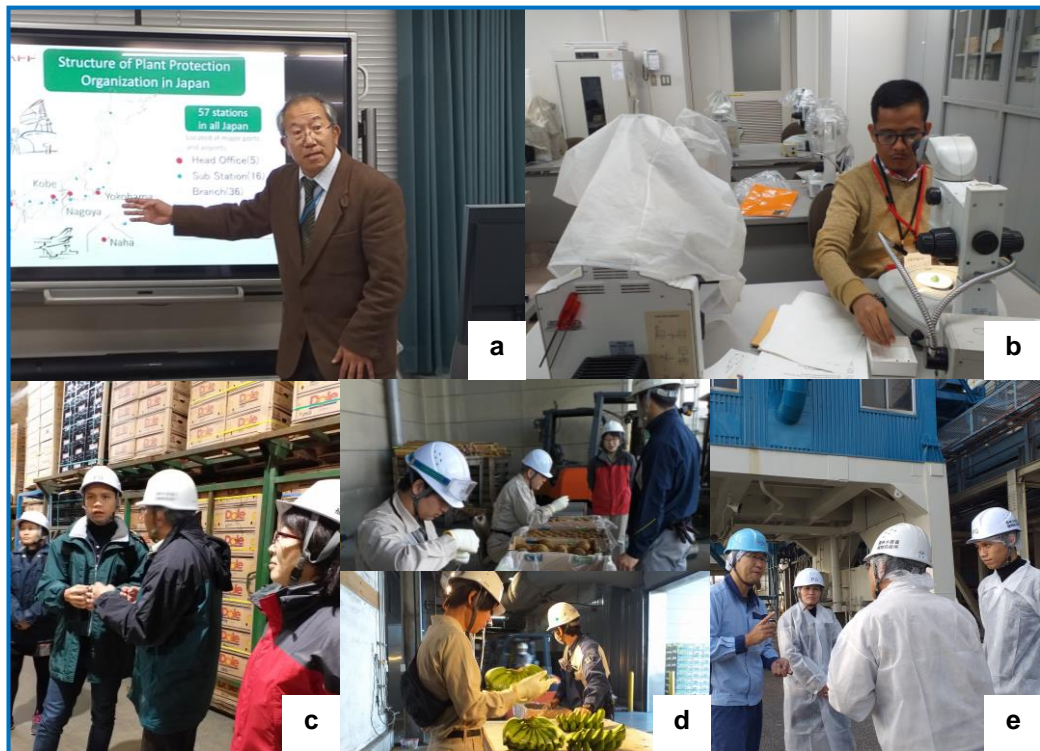


Fig. 3 Main activities at Kobe Plant Protection Station: (a) briefing and orientation; (b) laboratory activities; (c) visit to warehouse Kamigumi Co., Ltd.; (d) visit to plant quarantine inspection in port area; and (e) visit silo at Showa Sangyo Company

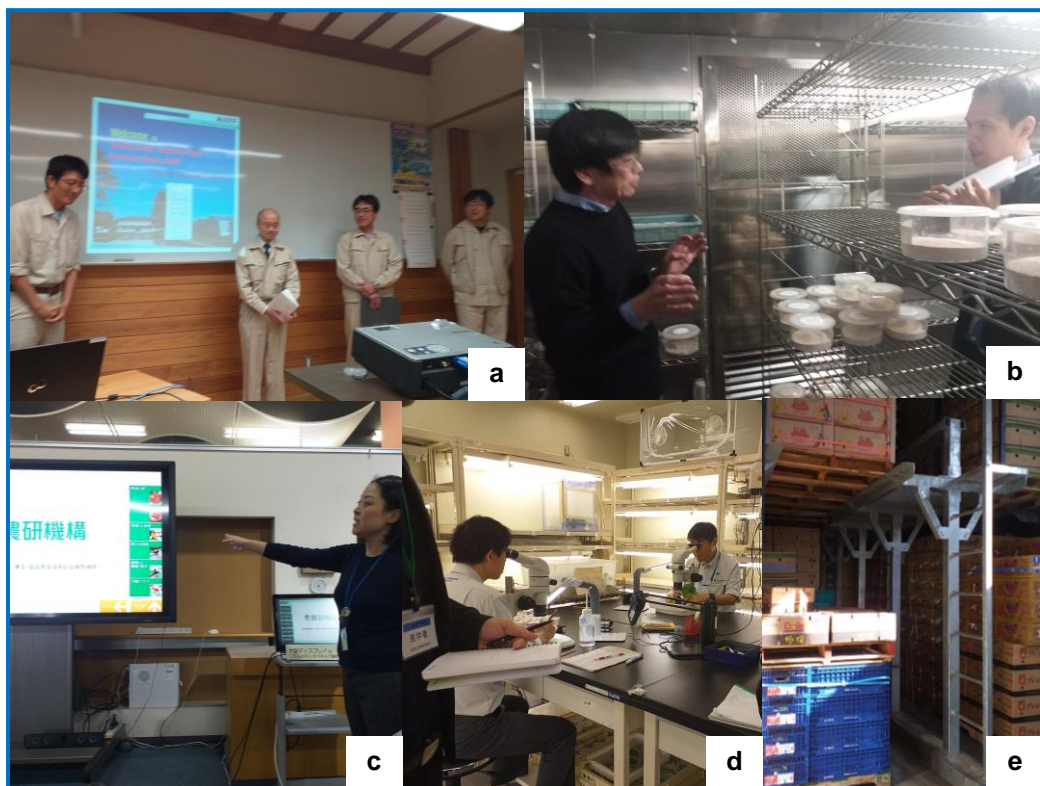


Fig. 4 Main activities at Tsukuba: (a) Visit to Tsukuba Center of Yokohama Plant Protection Station; (b) Visit to Food Entomology Laboratory of NARO; (c) visit to Tsukuba Agricultural Research Hall.; (d) visit to Nissan Chemical Company; and (e) Rippening facility at ANA Fresh Food Company

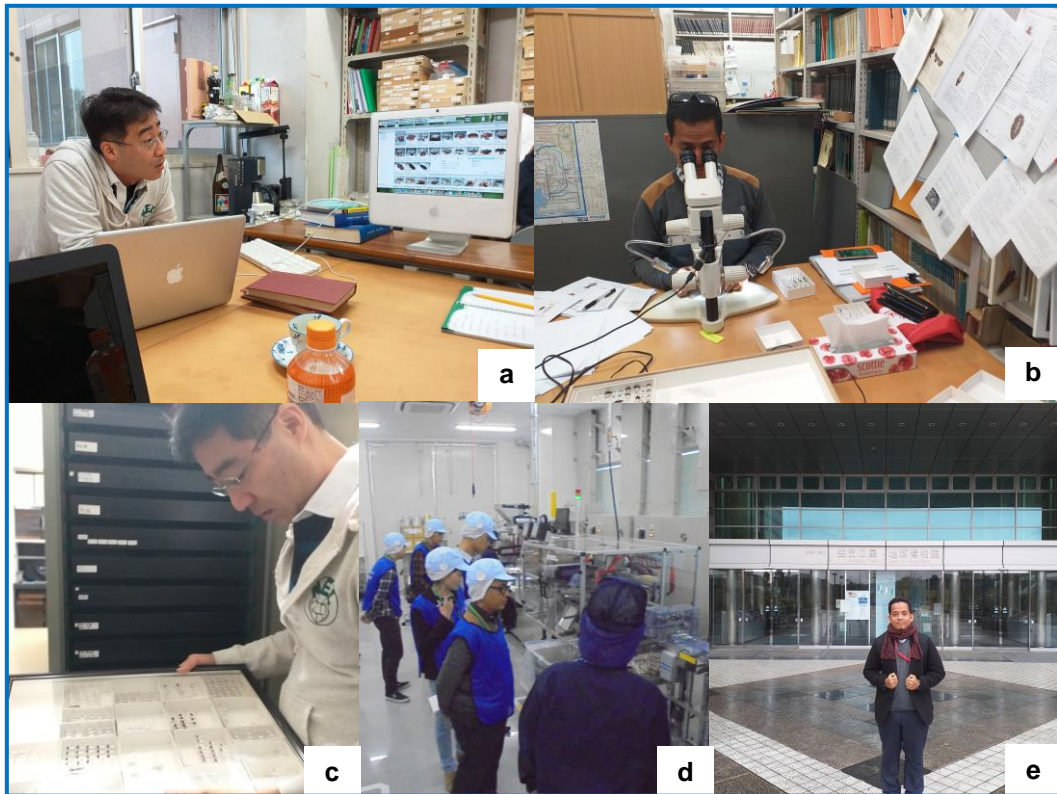


Fig. 5 Main activities at NODAI - Atsugi: (a) laboratory studies; (b) practice in the laboratory; (c) specimen collections studies; (d) visit to Fuji Flavour, Co., Ltd.; and (e) visit to Kanagawa Prefectural Museum of Natural History



Fig. 6 Other activities: (a) Visit to Medicinal Plant Garden attached to Hoshi<sub>79</sub> Pharmaceutical University; (b) collections of Meguro Parasitological Museum; (c) Travelling at Yokohama Bay; and (d) tea time at Senkeien Garden



Fig. 7 Some identified storage beetle specimens during the attachment program

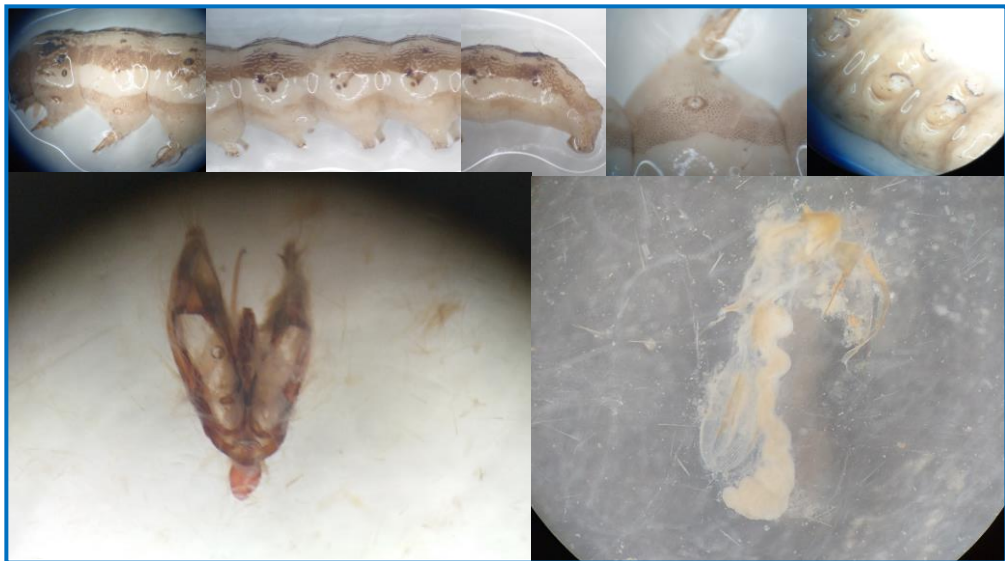


Fig. 8 Body part of Lepidoptera (storage pests) to identified