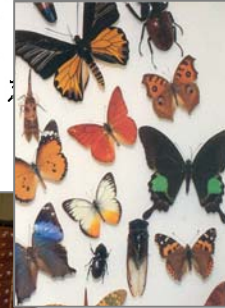




# Arthropod Collections of South East Asia



**Australian Government**  
**Department of Agriculture,  
Fisheries and Forestry**

**I. D. Naumann, M. Md. Jusoh & E. Lumb**

Arthropod Collections of South East Asia

I.D. Naumann, M. Md. Jusoh & E. Lumb

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ISBN 0-9751686-0-6

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Preferred way to cite this publication

Naumann, I. D., M. Md. Jusoh & Lumb, E. 2003. *Arthropod Collections of South East Asia*. Office of the Chief Plant Protection Officer: Canberra, Australia.



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Published by the Office of the Chief Plant Protection Officer,  
Australian Government Department of Agriculture, Fisheries and  
Forestry.

Supported by



**Australian Government**  
**AusAID**



**ASEANET**

November 2003



## ACKNOWLEDGEMENTS

We would like to thank the following people for their contributions towards this publication:

- Staff associated with the many collections listed here;
- ASEANET country coordinators and others who facilitated country visits, including:
  - Mr Jamaluddin Hj. Mohd. Yusoff and Mr Jomari bin Hj. Ahmad (Brunei Darussalam)
  - Dr Soenartono (“Tony”) Adisoemarto on behalf of Dr Effendy A. Sumardja (Indonesia)
  - Mr Phousit Phoumavong (Laos PDR)
  - Mrs Phyu Phyu Lwin (Myanmar)
  - Dr Horacio O. San Valentin and Dr Bonifacio Cayabyab (Philippines)
  - Ms Chew Ping Ting (Singapore)
  - Dr Banpot Napompeth (Thailand)
  - Ms Nguyen Thi Mai Chi on behalf of Dr Nguyen Van Tuat, and Professor Vu Quang Con (Vietnam)
- ASEANET Secretariat (Kuala Lumpur, Malaysia)
  - Dr Lum Keng Yeang and
  - Dr Soetikno S. Sastroutomo.
- Those who provided photographs, maps and images
  - Ms. Thitima Thongtab (Bangkok, Thailand)
  - Dr Grace Tabitha Lim (Kepong, Malaysia)
  - Dr Soetikno S. Sastroutomo
  - Dr Wilma R. Cuaterno (Manila, Philippines)
  - Dr Yayuk Suhardjono (Cibinong, Indonesia)
  - Division of Entomology and Zoology, Department of Agriculture Thailand (Bangkok, Thailand)
  - Dr Paul Pheloung (Canberra, Australia)

We warmly acknowledge funding provided by AusAID to enable visits to collection and the production of this booklet.

# Contents

<b>INTRODUCTION</b> .....	<b>10</b>
<b>BRUNEI DARUSSALAM</b> .....	<b>14</b>
Brunei Agricultural Research Centre.....	14
Plant Pest Unit (BARC).....	14
Public Health Services.....	15
Entomology and Malaria Lab Unit (MHBD).....	15
Universiti Brunei Darussalam .....	15
Biology Department (UBD).....	15
Royal Brunei Museum (RBM) .....	16
<b>INDONESIA</b> .....	<b>17</b>
Gadjah Mada University.....	17
Faculty of Biology (BGMY).....	17
Faculty of Agriculture (AGMY).....	18
SEAMEO BIOTROP (SBB) .....	18
Central Research Institute for Food Crops (FCB) .....	19
Bogor Agricultural University .....	19
Department of Plant Pests and Diseases (BAU) .....	19
Museum Zoologicum Bogoriense (MBBJ).....	20
Indonesian Agricultural Quarantine Agency (IAQA).....	21
<b>LAO PDR</b> .....	<b>23</b>
National Agriculture Forestry and Extension Service .....	23
Soil and Crop Extension Centre Houiyang (SCHL) .....	23
National Research Centre NaPook (NRCL) .....	23
Department of Agriculture.....	23
Quarantine Section (QVL).....	23
Plant Protection Centre Salakham (PPSL).....	24
<b>MALAYSIA</b> .....	<b>26</b>
Universiti Kebangsaan Malaysia.....	26
Centre For Insect Systematics (UKM).....	26
Universiti Putra Malaysia, Serdang .....	26
Plant Protection Department (UPM).....	26
Malaysian Agricultural Research and Development Institute .....	27
Strategic, Environment and Natural Resource Research Centre (MARD) ..	27
Department of Agriculture.....	28
Crop Protection & Quarantine Division (CPQDOA).....	28

Forest Research Institute Malaysia (FRIM).....	29
Agriculture Research Centre Kuching (ASSM) .....	30
Forest Research Center Kuching (FKSM).....	30
Universiti Malaysia Sarawak.....	31
Institute of Biodiversity & Environmental Conservation (UNIMAS) .....	31
Sabah Forest Department (FSSM).....	32
Agricultural Research Centre Kota Kinabalu (ARCKK).....	33
Malaysian Cocoa Board Kota Kinabalu (LKM).....	34
Universiti Malaysia Sabah.....	34
Institute for Tropical Biology & Conservation (ITBC) .....	34
<b>MYANMAR.....</b>	<b>36</b>
Myanmar Agriculture Service .....	36
Plant Protection Division (PPYM).....	36
Yezin Agricultural University .....	36
Department of Entomology (YAUM).....	36
<b>PHILIPPINES .....</b>	<b>38</b>
University of the Philippines Los Baños .....	39
Plant Quarantine Support Laboratory (CPUP).....	39
Department of Entomology .....	39
Museum of Natural History (UPPC).....	40
Benguet State University .....	40
Department of Entomology (BSUP).....	40
Central Luzon State University .....	41
College of Agriculture (CLMP).....	41
International Rice Research Institute (IRRI) .....	41
Philippines Rice Research Institute (PRRI).....	42
Department of Agriculture.....	42
Crop Protection Division (CPMP).....	42
National Museum of the Philippines (NPMP).....	43
<b>SINGAPORE.....</b>	<b>44</b>
Raffles Museum of Biodiversity Research .....	44
Entomological Collection (ZRC).....	44
Agri-food & Veterinary Authority of Singapore .....	45
Entomology Laboratory (AVAS) .....	45
Ministry of the Environment .....	45
Environmental Health Institute (EHIS) .....	45
National Parks Board.....	46
Singapore Botanic Gardens (SING).....	46



<b>THAILAND .....</b>	<b>47</b>
National Biological Control Research Center (NBCRC) .....	47
NBCRC Headquarters (BCBT).....	47
NBCRC Central Regional Centre (BCCT) .....	47
NBCRC Northern Regional Centre (BCCM) .....	48
NBCRC North Eastern Regional Centre (BCKK).....	48
NBCRC Southern Regional Centre (BCHY).....	49
Department of Agriculture.....	50
Entomology & Zoology Division (EMBT).....	50
Royal Forest Department.....	51
Forest Insect Group (RFBT) .....	51
Mae Jo University.....	51
Department of Plant Protection (PPMJ).....	51
Chiang Mai University .....	52
Department of Entomology (ECMT).....	52
Khon Kaen University .....	53
Department of Entomology (EKKT) .....	53
Prince of Songkla University.....	54
Department of Pest Management (PMHY).....	54
Faculty of Agriculture, Kasetsart University .....	54
Department of Entomology (AKBT).....	54
<b>VIETNAM .....</b>	<b>56</b>
National Institute of Plant Protection (NIPP) .....	56
Forest Science Institute of Vietnam (FSIV) .....	57
Hanoi Agricultural University (HAUV).....	58
Institute of Ecology and Biological Resources (IEBR) .....	58
<b>REFERENCES .....</b>	<b>60</b>
<b>MAP OF SOUTH EAST ASIA &amp; LOCATIONS OF ARTHROPOD COLLECTIONS.....</b>	<b>61</b>

## **Introduction**

This booklet provides basic information on the scientific collections that are maintained in the South-East Asian region and include preserved specimens of insects and their relatives, especially mites, spiders, millipedes, centipedes and terrestrial crustaceans. The information pertains to institutions in Brunei Darussalam, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

The collections fall into three broad categories. Firstly, there are those collections that reside in agencies whose principal responsibilities are crop or forest protection, quarantine or biological control. Not surprisingly, these collections are richest in plant pests, parasites, predators, biological control agents or “agrobiodiversity”. The second category comprises those within traditional museums, where the mission is to describe and interpret biodiversity in the widest sense. In these museum collections, specimens of agricultural significance sit within accumulations of natural history items that may be very extensive and extraordinarily diverse. The third category of collections comprises those maintained by teaching institutions. These collections follow diverse themes and reflect teaching priorities and the research interests of academic staff.

The information presented here was compiled principally during the first half of 2002. It is based upon interviews, visits and responses to a questionnaire, and was first made available within a report to the Australian overseas aid agency AusAID on the importance, strengths and vulnerabilities of regional collections (Naumann and Jusoh 2002). The report focused upon collections of pest species, but in reality encompassed all known collections of insects and their relatives. Since the report is not widely available, we have extracted basic contact details and short descriptions of each collection, and provide this information in the following pages.

Our purpose in preparing this booklet is twofold - to raise awareness of these mostly unknown collections among potential users and to facilitate networking among those who work with or are responsible for the collections.

It is critical to raise awareness of the collections as valuable information resources both within and beyond the South-East Asian region:

- Reference collections are critical to the identification of economically important species, especially in countries where taxonomic expertise is in short supply. While this concept may be well understood, the notion that collections of preserved insects also might be important to global trade is not. The WTO recognises the Sanitary and Phytosanitary (SPS) Agreement, which in turn requires that trading countries be able to document their plant health status. Specimens and records in reference collections enable countries to do this precisely and verifiably, a fact that should prompt plant protection organizations to be attentive to their national collections.
- The specimens and records in reference collections also document biodiversity in the widest sense. Reporting on biodiversity and its conservation is another national responsibility, as a result of commitment to the Convention on Biodiversity (CBD). It follows that the collections listed in this booklet are important to agencies that have biodiversity and conservation matters within their portfolio.
- It is encouraging that, as repositories become better known, they attract increasing attention from research taxonomists. Once aware of collections, these specialists tend to visit them or borrow selected material, as part and parcel of their own, specific research projects. Thus researchers make use of material that might otherwise have been overlooked and institutions, at least temporarily, “capture” expertise that exists only in another country or another hemisphere. The

overall result is that, progressively, old identifications are confirmed, misidentifications are corrected and unsorted material is named.

Our second major purpose here is to enhance communications among the very people and institutions listed - the individuals and agencies maintaining the collections. There are many challenges on the way to forming productive networks of reference collections in the South-East Asian region. This small booklet, we hope, overcomes at least one of these challenges.

Every effort has been made to ensure that the information here is comprehensive and accurate. However, it has not been possible to verify that all particulars are correct and current at the time of writing.

Collections have been listed if there seems to be a clear intention or desire to preserve the collection in the long term and the scope of the collection extends beyond the needs of a single activity or project. Several important institutions that are not listed here are beginning to accumulate significant material, for example as a result of post-graduate research projects, and could in the near future decide to consolidate this material into a discrete resource. For the moment it is premature to list this material as comprising a permanent institutional collection. We have also excluded (1) private or exclusively display collections, (2) teaching collections (in which individual specimens are more or less expendable) and (3) collections that reside outside the region, but hold specimens of South-East Asian origin.

We have not visited and have insufficient information on a number of collections in the Philippines. These collections are listed in a preamble to the standard, country table for that country.

Corrections and suggested additions should be forwarded to  
either:

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Collections included in this booklet will be listed on the *Insect and Spider Collections of the World* website maintained by Samuelson and Evenhuis of the Bernice P. Bishop Museum, Honolulu, Hawaii.

I. D. Naumann

M. Md. Jusoh

E. Lumb

*December 2003*

## BRUNEI DARUSSALAM

<b>Brunei Agricultural Research Centre</b>	
<b>Plant Pest Unit (BARC)</b>	
Suggested Collection Acronym	BARC
Address	Crop Development Division Department of Agriculture Ministry of Industry & Primary Resources Bandar Seri Begawan Brunei Darrussalam Bb3510
Website	<a href="http://www.brunet.bn/gov/doa/barc.htm">www.brunet.bn/gov/doa/barc.htm</a>
Contact person 1	Mr Jomari Bin Haji Ahmad
Phone	+673-2-670421
Fax	+673-2-661354
Email	Barc001@brunet.bn
Contact person 2	Mr Jamaluddin Hj. Md. Yusoff
Email	Barc001@brunet.bn
Number of specimens	Approx 5 000
<p>The Brunei Agricultural Research Centre was established in 1928 as an agricultural and livestock extension station. New laboratories and offices have been added to the complex and BARC is now the main centre for agricultural research in Brunei. The Plant Pest Unit maintains an arthropod collection of approximately 5000 specimens, about 75% of which are relevant to agriculture. The 4500 pinned specimens are stored in wooden cabinets imported from the United Kingdom. Specimens are pinned into movable cork slats. The collection room is air-conditioned. A small number of specimens have been arranged in display units. The collection is growing at a moderate rate, principally through crop surveillance work. About 3000 specimens have been identified to species and the remainder of the collection has been sorted to family level. In general specimens are not available for loan.</p>	

<b>Public Health Services</b>	
<b>Entomology and Malaria Lab Unit (MHBD)</b>	
Suggested Collection Acronym	MHBD
Address	Ministry of Health Jalan Menteri Besar BE 3910 Brunei Darussalam
Contact person 1	Mr Kamaludin bin Md. Yassin, Public Health Officer
Phone	+673-2-381640 x 7829
Fax	+673-2-381851
Email	Thunder_1@hotmail.com
Number of specimens	Small
The Ministry of Health maintains a very small reference collection of mosquitoes in support of the vector surveillance program.	
<b>Universiti Brunei Darussalam</b>	
<b>Biology Department (UBD)</b>	
Suggested Collection Acronym	UBD
Address	Tungku Link Rd Bandar Seri Begawan Be1410 Brunei Darussalam
Website	<a href="http://www.ubd.edu.bn">www.ubd.edu.bn</a>
Contact person 1	Dr Kamariah Binti Hj Abu Salim, Head of Department
Phone	+673-2-249001 x 387
Fax	+673-2-249502
Email	<a href="mailto:kamsalim@fos.ubd.edu.bn">kamsalim@fos.ubd.edu.bn</a>
Contact person 2	Awg Helen Pang Yoke Kiew, Curator of Museum & Herbarium
Phone	+673-2-249001 x 299
Email	<a href="mailto:Helen@fos.ubd.edu.bn">Helen@fos.ubd.edu.bn</a>
Number of specimens	About 450 (species)

<p>The insect collection within the Departmental Museum amounts to about 3500 pinned specimens, about 25% of which are relevant to agriculture. The collection is stored in wooden insect cabinets, imported from the USA. Fruit flies, butterflies and odonates are identified to species, other groups generally to family. The collection is growing through the incorporation of specimens from research projects of faculty members and visiting scientists, and the addition of selected specimens from collections assembled by undergraduates for assessment.</p>	
<p><b>Royal Brunei Museum (RBM)</b></p>	
Suggested Collection Acronym	RBM
Address	Jalan Kota Batu Bandar Seri Bagawan BD 1510 Brunei Darussalam
Phone	+673-2-244545
Website	<a href="http://www.museums.gov.bn">www.museums.gov.bn</a>
Contact person 1	Mariani Hj Abu Bakar
Contact person 2	Tuah bin Atar
Contact person 3	Hajah Kolam Hj Grayson
Number of specimens	25 000
<p>The arthropod collection comprises approximately pinned 25 000 specimens, accommodated in wooden cabinets, in an air-conditioned room. Additional, unsorted, “acquisition” material is kept in several dozen wooden boxes. About 25% of the collection is of agricultural relevance. It is strongest in larger insects, in particular Lepidoptera, Coleoptera and orthopteroids. The Hemiptera collection is strongest in cicadas. The collection is growing at a rate of 400-800 specimens annually, mostly from surveys in natural habitats and commonly, specimens are collected at light or other traps. The Museum is prepared to lend material to <i>bona fide</i> researchers. Four staff are associated with the collection.</p>	



## INDONESIA

<b>Gadjah Mada University</b>	
Address	Gadjah Mada University Yogyakarta 55281 Indonesia
<b>Faculty of Biology (BGMY)</b>	
Suggested Collection Acronym	BGMY
Contact person 1	Prof. Sukarti Moeljopawira, Dean, Faculty of Biology
Phone/ Fax	+62-274-580839
Email	biologi@ugm.ac.id
Contact person 2	Prof. Jesmandt Situmorang, Laboratory of Entomology
Phone	+62-274-902354 ext. 20
Fax	+62-274-580839
Email	jesmandts@hotmail.com
Contact person 3	Dr. Hari Purwanto, Laboratory of Entomology
Phone	+62-274-902261/580839
Contact person 4	Prof. Endang S. Soetarto, Microbial biologist
Phone	+62-274-902260
Fax	+62-274-580839
Number of specimens	10 000
<p>Some staff of Gadjah Mada University hold appointments to both Biological and Agricultural faculties. The University's undergraduate student numbers are high and each year about 200 students take courses in plant protection. Entomology classes average 70 students.</p> <p>The Faculty of Biology arthropod collection is housed in approximately 100 wooden, glass-topped boxes that are kept in wooden cabinets. The size of the collection is probably less than 10 000 specimens. Perhaps 25-50% of these are relevant to agriculture. Specimens are pinned directly into the bottom of boxes; unit trays are not used. Boxes are shelved two layers to each rack. Preserved specimens are used both for teaching and research and derive from staff research projects or from student collections, mostly from Java or Bali. There are important holdings of fruit flies resulting from the taxonomic work of Dr Santianawati and international collaborations with Dr Elmo Hardy, Hawaii, USA. Assistance with identifications is most frequently sought from Bogor. The Laboratory also maintains live "collections" in the form of cultures of silk worms and parasitic wasps, and an expanding butterfly house.</p>	

<b>Faculty of Agriculture (AGMY)</b>	
Suggested Collection Acronym	AGMY
Contact person 1	Dr. Y. Andi Trisyono, Department Head, Department of Entomology and Phytopathology
Phone	+62-274-902169
Fax	+62-274-563062
Email	andi@faperta.ugm.ac.id
Contact person 1	Dr. Eddy Mahrub, Entomologist
Phone	+62-274-902701
Fax	+62-274-563062
Number of specimens	30 000
<p>The Faculty of Agriculture collection is spread over 18 wooden cabinets, each of 16 drawers. The size of the collection is less than 30 000 specimens, with more than 75% of the specimens relevant to agriculture. Specimens are generally well labelled and have accumulated over a period of about 30 years, through collections by staff and students, throughout Indonesia. Two members of staff with taxonomic interests are able to devote 25-50% of their time to taxonomic work and maintenance of the collection. Work towards rehabilitating the collection has begun. The collection is slowly being reorganised and segregated into discrete teaching and museum collections. Three 16-drawer cabinets in the Biological Control laboratory form a significant annex to the main collection. The latter collection contains representatives of target species and biological control agents that have been studied and/or released.</p>	
<b>SEAMEO BIOTROP (SBB)</b>	
Suggested Collection Acronym	SBB
Address	SEAMEO BIOTROP Jl. Raya Tajur Km 6 PO Box 116 Bogor 16000
Phone	+62-251-323848
Fax	+62-251-326851
E-mail	info@biotrop.org
Website	www.biotrop.org
Contact person 1	Dr. Sunjaya
Contact person 2	Ir Kasno

Number of specimens	Small
<p>The South East Asian Regional Centre for Tropical Biology, (BIOTROP), is one of twelve centres under SEAMEO (the South East Asian Ministers of Education Organization). BIOTROP maintains a small collection representing about 265 pests of stored products. The collection comprises about 1000 alcohol vials, each numbered, well labelled and catalogued. It is kept in a compact wooden cabinet in an air-conditioned laboratory. BIOTROP regularly receives stored product pests from all over Indonesia for identification.</p>	
<b>Central Research Institute for Food Crops (FCB)</b>	
Suggested Collection Acronym	FCB
Address	Jl Cimanggu Kecil No.2 Bogor Indonesia
Contact person 1	Dr. Sri Suharni Siwi, Senior Researcher
Phone	+62-251-347923
Fax	+62-251-312755
Email	ssiwi@indo.net.id
Contact person 2	Ms Trisnaningsih
Number of specimens	3 247 species
<p>The collection of CRIFC is one of the largest and most important entomological collections in Indonesia. In 1989 some 3247 species were recognised in the collection. The bulk of the collection is of agricultural relevance. It is housed in two dozen, large, wooden entomological cabinets. Rehabilitation of the collection has commenced. Following the recent installation of a Biolink database package and training in its use, CRIFC has commenced databasing its collection. CRIFC is a key resource for Indonesian agriculture and critical provider of identifications. Dr Siwi is an active taxonomist with special interests in leafhoppers (Hemiptera) and fruit flies.</p>	
<b>Bogor Agricultural University</b>	
<b>Department of Plant Pests and Diseases (BAU)</b>	
Suggested Collection Acronym	BAU

Address	Jl. Pajajaran Bogor 16144 Indonesia
Contact person 1	Dr. Purnama Hidayat, Entomologist
Phone	+62-251-629364
Fax	+62-251-629362
Email	phidayat@ipb.ac.id
Contact person 2	Prof. Soemartono Sosromarsono, Professor of Entomology (retired)
Phone	+62-251-322079
Contact person 3	Dr. Dewi Sartiami
<p>The Department of Plant Pests and Diseases maintains an entomological collection, which occupies about 200 entomological drawers in five large, wooden cabinets. Ten new cabinets have been ordered and there are plans to refurbish and develop the collection as a reference and teaching resource. Most specimens are labelled adequately. The collection is accommodated in a modern, air-conditioned laboratory. There is also a significant quantity of useful entomological literature amassed during the colonial era. Departmental staff have taxonomic skills covering the scale insects, aphids, whiteflies, Hymenoptera and weevils. A good selection of reference works were in use in the research laboratories, but access to new journals is limited. Internet access is generally good. Some staff have experience in molecular diagnostics and one laboratory is equipped with PCR machines. The collection and taxonomy have the support of the Head of Department, there is a trained collection curator, the Department has a healthy postgraduate program, and the University is geographically well placed to collaborate with taxonomic specialists at the Museum Zoologicum Bogoriense, Cibinong, and CRIFC, Bogor, in postgraduate training.</p>	
<b>Museum Zoologicum Bogoriense (MBBJ)</b>	
Suggested Collection Acronym	MBBJ
Address	Jl Raya Jakarta - Bogor, Km 46 Cibinong, 16911 Bogor, Indonesia
Contact person 1	Dr Yayuk Suhardjono (Entomology)
Fax	+62-21-8765068
Email	yayukrs@indo.net.id
Contact person 2	Dr. Siti Nuramaliati Prijono, Museum Director

Number of specimens	2 000 000
<p>The MZB was established in the late nineteenth century by Dutch and for most of its life resided along with the herbarium in a colonial building within the internationally renowned Bogor Botanical Gardens. Recently the MZB has moved to new quarters on the Indonesian Institute of Sciences (LIPI) campus at Cibinong. The entomological collection stands at about 2 million specimens and is the largest in the region. Pinned specimens are kept in unit trays in several hundred near-new metal cabinets. Alcohol specimens are stored in jars shelved with other zoological specimens. The collection has central air-conditioning and de-humidification systems. Specimens are well prepared and well labelled, and the collection has been growing rapidly. The focus is upon biodiversity studies and the bulk of the material is from natural habitats rather than cropping systems. Few specimens have host data. Two full-time technicians, 2 collection managers, and over a dozen taxonomists, several “emeritus” staff, are associated with the collection.</p> <p>A Biodiversity Information Centre is a focal point for the databasing of zoological and herbarium specimens. Initial, “borrowed” databases packages have given way to a purpose-built, specimen-based database and the Centre is a participant in current, GBIF-coordinated, global initiatives to link and develop databases. It is possible that in the near future the entomological collection will adopt a Biolink database system, which the Centre will link to its IBIS system.</p>	
<b>Indonesian Agricultural Quarantine Agency (IAQA)</b>	
Suggested Collection Acronym	IAQA
Address	Indonesian Agricultural Quarantine Agency (IAQA) Gedung E, Lantai V Departemen Pertanian Jalan Harsono R.M. 3 Pasarmingu Jakarta 12550 Indonesia
Contact person 1	Mr Suwanda, Director
Contact person 2	Ms Rumenda Ginting
Number of specimens	Small
<p>IAQA has a broad quarantine role in Indonesia and a network of laboratories and offices from Sumatra to Papua. The Jakarta laboratories have recently been refurbished. Each regional centre maintains a small reference collection and the spectrum of species represented varies from region to region. IAQA</p>	

possesses the PDI Database System that was developed and provided by Australian Quarantine Inspection Service but this has lapsed into disuse. The need for an Internet-based information system, including a database, to service the network of laboratories is recognised. The entomological reference collection in Jakarta is small with only a handful of species represented, although specimens have been skilfully prepared.

## LAO PDR

<b>National Agriculture Forestry and Extension Service</b>	
<b>Soil and Crop Extension Centre Houiyang (SCHL)</b>	
Suggested Collection Acronym	SCHL
Address	Ministry of Agriculture and Forestry Thagone Rd, PO Box 1640 Vientiane, Lao PDR
Contact person 1	Mr Phousit Phoumavong
Phone	+856-21-732309
Fax	+856-21-812130
Email	ipmlaos@attglobal.net
Number of specimens	Not known
Collection not seen.	
<b>National Research Centre NaPook (NRCL)</b>	
Suggested Collection Acronym	NRCL
Address	NaPook Vientiane Lao PDR
<p>The National Research Centre is a facility of the National Agriculture Forestry and Extension Service. Research on rice has been a major focus. The reference collection of the Plant Protection Section in NaPook comprises a small number of pinned specimens and about 1200 vials of specimens preserved in alcohol. All material is accommodated in a large laboratory with adequate storage and working space. The collection derives from survey work undertaken in the past, often in collaboration with international visitors (e.g. from the International Rice Research Institute in the Philippines).</p>	
<b>Department of Agriculture</b>	
<b>Quarantine Section (QVL)</b>	
Suggested Collection Acronym	QVL

Address	Quarantine Section (QVL) Service of Agriculture and Forestry of Vientiane Municipality Ministry of Agriculture and Forestry Friendship Bridge Vientiane Province Lao PDR
Contact person 1	Mr Thongsavanh Taipangnavong, Chief of Plant Quarantine and Provincial IPM Coordinator
Phone	+856-21-812162
Fax	+856-21-832083
Number of specimens	Small
The Quarantine Service maintains paper records of pests detected on export commodities but the exact origin of the pests is not known (records simply state "Laos"). There is a very small reference collection to assist with the performance of identifications.	
<b>Plant Protection Centre Salakham (PPSL)</b>	
Suggested Collection Acronym	PPSL
Address	Ministry of Agriculture and Forestry PO Box 811/ PO Box 8914 Vientiane, Lao PDR
Contact person 1	Mr Saleumsy Phithayaphone, Deputy Director
Phone	+856-21-812110
Fax	+856-21-812090
Email	doag@laotel.com
Contact person 2	Mr Viengsavay Sensourivong, Head of Plant Protection Section and National BUCAP Project Coordinator
Phone	+856-21-507605
Fax	+856-21-812090
Email	vsvbucap@laopdr.com
Contact person 3	Mr Tiangkham Vongsabout
Phone	+856-21-812164
Fax	+856-21-812090
Number of specimens	Small



The Plant Protection Centre at Salakham comprises three small units: entomology (2 professional staff); plant pathology (2 professional staff); and plant quarantine.

The arthropod collection is very small. Many pinned specimens lack labels and have been identified to order level only. The collection room is within a spacious building, but in need of refurbishment, air-conditioning and a de-humidification unit.

## MALAYSIA

<b>Universiti Kebangsaan Malaysia</b>	
<b>Centre For Insect Systematics (UKM)</b>	
Suggested Collection Acronym	UKM
Address	Centre for Insect Systematics, Universiti Kebangsaan Malaysia 43600 Bangi Selangor, Malaysia
Contact person 1	Professor Mohamed Salleh Mohamed Said
Phone	+60-03-89292872
Fax	+60-03-89253357
Email	mohds@pkrisc.cc.ukm.my
Contact person 2	Ms Salmah Yaakop
Number specimens	100 000
<p>The collection comprises approximately 100 000 pinned specimens, about 80 000 of which have been identified, and includes a significant number of types of chrysomelid beetles and cicadas. About 25% of the collection is of agricultural relevance. The collection has expanded rapidly in recent years, principally from surveys in forest habitats. Specimens have been well prepared and labelled, and are accommodated in unit trays in entomological cabinets.</p>	
<b>Universiti Putra Malaysia, Serdang</b>	
<b>Plant Protection Department (UPM)</b>	
Suggested Collection Acronym	UPM
Address	Universiti Putra Malaysia 43300 Serdang Selangor, Malaysia
Contact person 1	Dr. Dzolkifli Omar
Email	zolkifli@agric.upm.edu.my
Contact person 2	Mr Mohd Salleh
Number specimens	Less than 10 000

<p>UPM came into being in 1971 as Universiti Pertanian Malaysia, through the merger of the old Faculty of Agriculture of the University of Malaya and the old Agriculture College Malaysia, Serdang. UPM now occupies a large, modern campus with approximately 1500 academic staff and a student body of over 32 000.</p> <p>The small arthropod collection of UPM resides within the Plant Protection Department. It comprises fewer than 10 000 specimens. Specimens at UPM are generally well prepared and labelled, and are mostly identified to species level. They are pinned into wooden drawers with tightly-sealing lids. The drawers run on a sturdy, open, aluminium frame in an air-conditioned room. There is some prospect of a new building, which would accommodate the collection. The University would value advice on optimal design and climate control for the collection.</p>	
<p><b>Malaysian Agricultural Research and Development Institute</b></p>	
<p><b>Strategic, Environment and Natural Resource Research Centre (MARD)</b></p>	
Suggested Collection Acronym	MARD
Address	Malaysian Agricultural Research and Development Institute (MARDI) Serdang, Selangor, Malaysia
Contact person 1	Dr Mohamed Rani Mat Yusoh, Research Officer
Phone	+60-03-89437349
Fax	+60-03-89487639
Email	mrmy@mardi.my
Number specimens	26 408
<p>MARDI was established in 1969 to take a leading role in agricultural research in Malaysia. An arthropod reference collection amounting to approximately 30 000 specimens is housed at MARDI's Serdang laboratories. The collection comprises approximately 24 000 pinned specimens, about 590 specimens in alcohol, some 2350 slide mounts (mostly thrips), and an additional quantity of dry specimens. All are relevant to agriculture. Specimens are generally well prepared and labelled, although some lack critical data. The number of specimens requiring identification exceeds 800 per year and this figure is increasing each year. Identifications are performed by MARDI officers. The pinned collection is divided into two sections. One section is arranged by taxonomic grouping (order) and accommodated in wooden boxes in a small, metal compactus. The second section of the collection is arranged by crop and accommodated in wooden cabinets. The alcohol collection is divided</p>	

between a cupboard and open shelving. The collection room is air-conditioned. Substantial paper records accompany the collection. A journal, a card catalogue and files of original correspondence fully document specimens that were identified by specialists at the Natural History Museum, London. Databasing using Microsoft Access has commenced.

<b>Department of Agriculture</b>	
<b>Crop Protection &amp; Quarantine Division (CPQDOA)</b>	
Suggested Collection Acronym	CPQDOA
Address	Jalan Gallagher 50480 KUALA LUMPUR MALAYSIA
Contact person 1	Mr Yusof Bin Othman
Phone	+60-03-26977137
Fax	+60-03-26977205
Email	yusof@pq.doa.moa.my
Contact person 2	Ms Asna Booty Othman, Director
Number specimens	85 908

The Department of Agriculture collection is one of the largest and oldest zoological and agricultural collections in Malaysia. It is estimated to contain some 86 000 specimens, including many collected during the colonial era and some which are said to have come via the original Raffles Museum, Singapore and the Selangor Museum. The collection comprises approximately 76 000 pinned specimens in 522 wooden store boxes, about 3500 alcohol vials, about 1200 slide mounts, and some additional specimens preserved dry with host material. All are relevant to agriculture, having been collected by crop protection officers, during surveys and field trials, by quarantine inspectors, farmers, pest control operators and extension officers. Material continues to be received from regular surveys of citrus, mango, hot peppers, long beans and sweet corn. Specimens generally are accompanied by standard data, including many valuable host plant associations. Store boxes are accommodated on open shelves.

Antiquarian entomological books, exquisite works of art, card catalogues and other documents associated with the collection are little-known national treasures.

The Department of Agriculture has published a catalogue to the plant pests and diseases recorded from Peninsular Malaysia between 1920 and 1978, and this catalogue is currently being updated, with the assistance of collection records and associated documentation. There is interest in the development of

appropriate web delivery of this information, potentially via a database and a WAN (Wide Area Network) serving the Department's geographically dispersed officers.

**Forest Research Institute Malaysia (FRIM)**

Suggested Collection Acronym	FRIM
Address	Kepong, 52109 Kuala Lumpur, Malaysia
Contact person 1	Dr Grace Tabitha Lim, Research Officer, Entomology
Phone	+60-03-62797110
Email	grace@frim.gov.my
Number specimens	597 500

The Institute maintains a small, public museum which exhibits different types of woods, information on forest-dependent industries, and various wood products. The reference and research collections are much more extensive, and the arthropod collection is one of the largest in the country. The arthropod collection comprises approximately 160 000 pinned specimens and 7500 slide mounts. The alcohol collection includes many series of termites and totals perhaps 430 000 individuals. Specimens are well prepared and labelled, and accommodated in wooden cabinets, in a spacious, air-conditioned collection room. The Entomology Unit is in the process of implementing an ISO9001:2000E Quality Management System for the type collection.

The collection derives from collections in plantations and natural forests during scientific expeditions, research and postgraduate projects. It has also received voucher specimens from abroad, such as material deposited by visiting scientists from Japan. About 25% of the collection would be relevant to agriculture. An increasing number of specimens each year require identification (at present 100-400 specimens). FRIM has a very important termite collection, reflecting the taxonomic research of the late Y.P. Tho and current curator L.G. Kirton. Other significant holdings include the collection of wood-boring beetles, a large collection of geometrid moths assembled in conjunction with a now-completed biodiversity study, and large numbers of stingless bees. Microscope facilities are good and there are excellent literature resources for some groups, e.g. termites. FRIM's own expertise encompasses entomology, taxonomy and pest management. The collection has been developed as an adjunct to applied research, and the high curatorial standards mean that it continues to be useful to that research.

<b>Agriculture Research Centre Kuching (ASSM)</b>	
Suggested Collection Acronym	ASSM
Address	PO Box 977 93720 Kuching Sarawak, MALAYSIA
Contact person 1	Mr Ron Ah Goh
Phone	+60-82-611171
Fax	+60-82-611178
Email	ronag@sarawaknet.gov.my
Number specimens	21 000 species
Contact person 2	Mr Stephen Leong Chan Teck, Entomologist
Phone	+60-82-611171
Fax	+60-82-611178
Email	Dragon8leong@yahoo.com
Contact person 3	Ms Megin Gumbok
<p>The programs of the Agriculture Research Centre focus on citrus and other fruit crops, vegetables, herbs, rice and apiculture. The Centre maintains a collection of approximately 22 000 specimens, of which about 25% are relevant to agriculture. Specimens are pinned and stored in about 125 wooden store boxes, which are shelved in an air-conditioned collection room. There are also 40-50 wooden drawers of commodity-based collections. About 15 000 specimens have been identified, mostly in the past by IIE, CIE or CABI specialists. There is no database to the collection, but Wan (1970) "A List of insects and other animals of economic importance of Sarawak" provides an index to the collection and a starting point for a databasing exercise.</p>	
<b>Forest Research Center Kuching (FKSM)</b>	
Suggested Collection Acronym	FKSM
Address	Forest Department Sarawak Km 10, Jalan Penrissen 93250 Kuching Sarawak, Malaysia
Contact person 1	Ms Lucy Chong, Assistant Director of FRC
Phone	+60-82-615888

Fax	+60-82-617953
Contact person 2	Mr Ernest Chai Oi Khun
Phone	+60-82-615888
Fax	+60-82-617953
Email	echai@tm.net.my
Contact person 3	Mr Ernest Chai Oi Khun
Contact person 4	Mr Paulus Meleng
Contact person 5	Mr Marfaisal Marzuki
Number of specimens	500 000
<p>The Forest Research Centre is responsible for a large and rapidly expanding collection of more than 500 000 specimens. About 25% of the collection is relevant to agriculture and another 25% to forestry. The collection reflects strong interests in forest biodiversity and active, recent collection, especially in the Lambir Hills National Park. Accumulation of specimens per annum exceeds 1000, and includes specimens collected during regular surveys of plantation trees (e.g. dipterocarps, Australian <i>Acacia</i>). The majority of specimens derive from light traps, collecting from a canopy crane, and Malaise traps. Almost all identified specimens have been databased. The pinned collection is housed in large wooden cabinets in an air-conditioned room. The alcohol collection, which amounts to about 10 0000 specimens, is stored in two separate rooms.</p>	
<b>Universiti Malaysia Sarawak</b>	
<b>Institute of Biodiversity &amp; Environmental Conservation (UNIMAS)</b>	
Suggested Collection Acronym	UNIMAS
Address	Universiti Malaysia Sarawak, 94300 Kota Samarahan Sarawak Malaysia
Website	<a href="http://www.unimas.my">http://www.unimas.my</a> <a href="http://www.unimas.my/en/ibec/index.htm">http://www.unimas.my/en/ibec/index.htm</a> (under construction, as at June 2002)
Contact person 1	Dr Fatimah Abang, Director
Phone	+60-82-672318
Fax	+60-82-671727
Email	fatim@ibec.unimas.my
Number specimens	Around 40 000

Contact person 2	Dr Dennis Hill
Phone	+60-82-671000 x255
Fax	+60-82-671727
Email	dshill@ibec.unimas.my
<p>The Institute of Biodiversity and Environmental Conservation within UNIMAS maintains a collection of about 40 000 specimens, about 25% of which are of agricultural relevance. The collection is growing at a steady rate of 100-400 specimens annually, from staff and postgraduate student research projects (most of which have a biodiversity focus) and from undergraduate student collections submitted for assessment. Pinned specimens are kept in about 150 drawers in cabinets imported from the USA.</p>	
<b>Sabah Forest Department (FSSM)</b>	
Suggested Collection Acronym	FSSM
Section	Environmental Sciences Division, Forest Research Centre
Address	Forest Research Centre PO Box 1407 90715 Sandakan Sabah, Malaysia
Contact person 1	Dr Chey Vun Khen, Head Forest Entomologist
Phone	+60-89-538202 ext. 31
Fax	+60-89-531068
Email	frc@tm.net.my cheyvk@tm.net.my
Number of specimens	100 000



<p>The collection currently totals over 100 000 specimens, of which about 75% are relevant to forestry. Almost all specimens were collected in Sabah, largely by hand or from light traps. Well over 800 specimens are acquired annually and the acquisition rate is increasing. The collection is particularly strong in macro-Lepidoptera and many families of Coleoptera, for example Cerambycidae. The pinned material is housed in about 50 wooden cabinets of various design and quality.</p> <p>It is estimated that 10 000 species are represented in the collection, but many are unnamed and have been recognised as “morphospecies” in the context of biodiversity studies. Dr Chey has particular expertise in Lepidoptera, Coleoptera and termites, and collaborates with a wide range of national and international specialists, e.g. at Universiti Kebangsaan Malaysia in peninsular Malaysia in connection with work on chrysomelid beetles, in the U.K. and Australia in connection with Lepidoptera. The Centre is an international focal point for biodiversity studies and taxonomists.</p>	
<b>Agricultural Research Centre Kota Kinabalu (ARCKK)</b>	
Suggested Collection Acronym	ARCKK
Address	Agriculture Research Centre PO Box 3 89207 Tuaran, Sabah
Contact person 1	Mr Jinius Jipanin
Phone	+60-88-788590
Fax	+60-88-788548
Email	Roo.11.@sabah.gov.my
Number of specimens	30 000
<p>Entomological research commenced at the Centre in 1937 and the insect collection (which includes some specimens dating back to 1917) has been accommodated in its current quarters since 1963. The collection is estimated to comprise about 30 000 specimens.</p> <p>The pinned collection currently occupies about 60 wooden cabinets and about 150 store boxes. A unit tray system is in use in the cabinets. Some of the cabinet drawers consist of synoptic collections of pests grouped by crops. Specimens are well labelled. Some 1985 species, all of agricultural relevance, are represented. About 200 species are represented in the alcohol collection, which is held in vials within about 60 jars. The jars also contain alcohol so routine topping up of alcohol can be done efficiently. Arthropod specimens are obtained each year from regular hand and light trap collections in rice, vegetable, maize and fruit crops, but fewer than 100 specimens are added per</p>	

year to the collection. A full-time technical assistant is responsible for the collection, under the direction of an entomologist with skills in crop protection. Currently, specimens are not lent but requests from *bona fide* researchers would be considered in future.

The card catalogue associated with the collection is an additional, valuable source of information on pest species and host plant associations, which is currently being transferred to a Microsoft Access database. At present records are accessible by directly contacting the Centre.

<b>Malaysian Cocoa Board Kota Kinabalu (LKM)</b>	
Suggested Collection Acronym	LKM
Address	Locked Bag 211, 88999 Kota Kinabalu, Sabah, Malaysia
Contact person 1	Dr. I. Azhar, Director General
Phone	+60-88-252572
Fax	+60-88-239575
Email	abi@koko.gov.my
Website	www.koko.gov.my
Contact person 2	Dr. Lee Ming Tong, Deputy Director General (Research)
Email	leemt@koko.gov.my
Contact person 3	Dr Lee Choon Hui
Phone	+60-88-56488176
Fax	+60-88-5646489151
Email	chlee@koko.gov.my
Number of specimens	Small
The Malaysian Cocoa Board collection comprises approximately 50 boxes of cocoa and coconut insects collected throughout Malaysia. The collection is accommodated in new, air-conditioned facilities at Tawau, on the southeast coast of Sabah. The collection is maintained by a part-time technician.	
<b>Universiti Malaysia Sabah</b>	
<b>Institute for Tropical Biology &amp; Conservation (ITBC)</b>	
Suggested Collection Acronym	ITBC
Address	Locked Bag 2073 88999 Kota Kinabalu Sabah, Malaysia
Contact person 1	Prof. Maryati Mohamed

Contact person 2	Assoc. Prof. Mennon Schilthuisen
Phone	+60-88-320000 ext. 5610
Fax	+60-88-435311
Email	schilthuisen@excite.com
Website	www.ums.edu.my/ibtp
Number of specimens	32 000
<p>The Institute for Tropical Biology and Conservation (ITBC) was established as a Unit of Universiti Malaysia Sabah (UMS). The Institute's research and development program has grown rapidly to encompass studies in biodiversity (e.g insect fauna of the rainforest canopy; bio-monitoring) and systematics (e.g. of termites and ants), ecological processes, the use of biodiversity (e.g. as sources of natural, medicinal products) and ecotourism. The reference collections (BORNEENSIS) include an herbarium, an insect collection and a collection of living plants. Currently, the Institute has expertise in the identification of a wide range of arthropod groups, including butterflies, ants, dung beetles, trichogrammatid wasps, termites, lucanid and other beetles, and aphids. Many biodiversity studies rely on the recognition of "morphospecies" rather than the application of formal, species-level nomenclature.</p> <p>The insect collection is currently in wooden boxes, drawers and vials. It totals about 32 000 specimens, mostly from collections in natural habitats. The collection rooms are serviced by high capacity, air-conditioning and de-humidification plants. Laboratory facilities are excellent: light microscopes, digital cameras, an electron microscope, and the basic equipment for a molecular laboratory, were either installed or expected.</p>	

## MYANMAR

<b>Myanmar Agriculture Service</b>	
<b>Plant Protection Division (PPYM)</b>	
Suggested Collection Acronym	PPYM
Address	Ministry of Agriculture & Irrigation Bayint Naung Rd, Insein P.O. 11011 Yangon. Union of Myanmar
Contact person 1	Mr Than Aye, Head of the Division
Phone	+95-01-663397
Fax	+95-01-667991
Email	Ppmas.moai@mptmail.net.mm
Contact person 2	Mrs Phyu Phyu Lwin, Entomology Section Head
Number of specimens	Small
<p>The Plant Protection Division maintains a small arthropod reference collection. Pinned specimens are housed in six Bioquip cabinets, with well-sealing doors and drawer lids. The cabinets are kept in a large laboratory occupied by about half a dozen staff. The alcohol collection is relatively small and comprises principally immature insects. There is a small, separate collection of alcohol-preserved, parasitic insects in the Division's IPM laboratory. Routine fieldwork by officers of the Division provides opportunities for surveys of pest and beneficial arthropods.</p>	
<b>Yezin Agricultural University</b>	
<b>Department of Entomology (YAUM)</b>	
Suggested Collection Acronym	YAUM
Address	Yezin Agricultural University, Yezin, Myanmar
Contact person 1	Dr Myint Thaug, Professor
Phone	+95-67-21098
Number of specimens	Small
<p>Yezin University was established in 1924 in Mandalay as an agricultural college and research institute. It is now located in the village of Yezin and part of the Ministry of Agriculture and Irrigation. The collection of the</p>	

Department of Entomology is maintained for teaching rather than reference purposes.

## PHILIPPINES

Insufficient information is available on a number of Philippines collections to include them in the table below. The collection at the University of San Carlos, Cebu City is reported to comprise about 20 000 pinned specimens and a large quantity of unmounted material. Pinned specimens are said to be stored in cabinets and available for loan (Tumilap 1984). The Biological Museum, Visayas State College of Agriculture, Bayaby, Leyte is reported to contain about 35 000 specimens, including a significant collection of slide-mounted mites (Arnet et al. 1993).

In addition, the following institutions are said to hold collections of agricultural pests and pathogens:

### **Luzon:**

Bureau of Plant Industry, Baguio City; University of the Philippines Diliman, Manila; Cavite State University, Camarines Sur State Agricultural College, Bicol.

Los Baños region:

Institute of Biotechnology Institute of Plant Breeding; and Ecosystems Research and Development Bureau – Department of Environment and Natural Resources and Satellite Offices.

Various regions:

Philippines Coconut Authority (PCA); Fiber Industry Development Authority; Sugar Regulatory Administration; Philippine Tobacco Administration.

### **Mindanao:**

Ateneo de Davao, Philippines Banana Growers Association, Davao City; University of Southern Mindanao, North Cotabato; Notre Dame University, South Cotabato; Paper Industry Corporation of the Philippines, Surigao; Central Mindanao University, Bukidnon;

Department of Agriculture Regional Field Units and Regional Crop Protection Centers throughout Luzon, Visayas and Mindanas are also said to possess small reference collections.

<b>University of the Philippines Los Baños</b>	
<b>Plant Quarantine Support Laboratory (CPUP)</b>	
Suggested Collection Acronym	CPUP
Address	Plant Quarantine Support Laboratory National Crop Protection Centre College of Agriculture University of the Philippines Los Baños College Laguna 4031
Contact person 1	Dr. Eliseo P. Cadapan, Director NCPC & Prof. Dept. Entomology
Phone	+63-49-5360975
Fax	+63-49-5362409
Email	npc@mudspring.uplb.edu.ph
Contact person 2	Dr. Bonifacio Cayabyab
Contact person 3	Ms Jessamyn D. Recuenco-Adorada
Phone	+63-49-5362410
Fax	+63-49-5362409
Email	jdradorada@yahoo.com
Number of specimens	Small
The Plant Quarantine Support Laboratory maintains a collection of about 50 wooden store boxes of pinned insects, several dozen vials of alcohol-preserved specimens, and two small boxes of slides. Specimens are well prepared and labelled. The Laboratory provides identifications of diverse arthropods in support of various applied projects.	
<b>Department of Entomology</b>	
Address	Department of Entomology University of the Philippines Los Baños College, Laguana Philippines 4031
Contact person 1	Dr. Virginia Ocampo
Contact person 2	Dr.S.G. Reyes

The large, university insect collection (UPPC, see next entry), is housed in the same building as the Department, however Departmental staff have no formal appointments as curators of the collection.	
<b>Museum of Natural History (UPPC)</b>	
Suggested Collection Acronym	UPPC
Address	University of the Philippines Los Baños College 4031, Laguna, Philippines
Contact person 1	Dr. Ireneo L. Lit, Entomologist
Phone	+63-49-5362864
Email	mnh@laguna.net
Contact person 2	Assoc. Prof. Lourdes B. Cardenas, Director
Website	www.laguna.net/uplbmuseum
Number specimens	Over 110 000
The UP Los Baños Museum of Natural History was established in 1976 and comprises about seven separate collections, most of which are housed in various departments scattered over the UP Los Baños. The entomological collection has been rebuilt since its destruction during World War II and now, with well over 100 000 pinned specimens and over 10 000 slide mounts, it is once again the largest arthropod collection in the Philippines. The pinned insects are housed in wooden cabinets and store boxes.	
<b>Benguet State University</b>	
<b>Department of Entomology (BSUP)</b>	
Address	Department of Entomology College of Agriculture Benguet State University La Trinidad, Benguet
Contact person 1	Assoc. Prof. Bonie S. Ligat
Number of specimens	small
The small collection of the Department of Entomology is used largely for teaching. Specimens are added each year from student collections and utilised in practical classes. Specimens are kept in wooden store boxes in a small room.	



<b>Central Luzon State University</b>	
<b>College of Agriculture (CLMP)</b>	
Suggested Collection Acronym	CLMP
Address	Central Luzon State University, Nueva Ecija 3120 Philippines
Contact person 1	Dr. Elaida R. Fiegalan
Contact person 2	Ms Arlene G. Villameva
Number of specimens	Fewer than 10 000
Website	<a href="http://www.2.mozcom.com/~clsu/">www.2.mozcom.com/~clsu/</a>
<p>The Central Luzon State University College of Agriculture maintains a small arthropod collection for teaching and reference purposes. Much of the collection has been transferred to new wooden cabinets. The collection is estimated as fewer than 10 000 specimens. Specimens come almost entirely from the Central Luzon area and many derive from student collections submitted for assessment. A high percentage of specimens are of agricultural relevance. Pests of various commodities are exhibited in a series of 16 metal display drawers. The collection also includes some dried plant specimens demonstrating insect damage.</p>	
<b>International Rice Research Institute (IRRI)</b>	
Suggested Collection Acronym	IRRI
Address	DAPO Box 7777 Metro Manila Philippines
Contact person 1	Dr. Alberto T. Barrion
Phone	+63-2-8450563, +63-2-8450569
Fax	+63-2-8450606
Email	<a href="mailto:irri@cgiar.org">irri@cgiar.org</a>
Website	<a href="http://www.irri.org/index.htm">http://www.irri.org/index.htm</a>
Number specimens	Around 90 000
<p>The International Rice Research Institute maintains an entomological reference collection of about 90 000 specimens, principally relevant to rice cropping systems. Material from this collection has been accumulated over many decades from localities throughout South East Asia.</p>	

<b>Philippines Rice Research Institute (PRRI)</b>	
Suggested Collection Acronym	PRRI
Address	Phil Rice Maligaya, Munoz 3119 Nueva Ecija Philippines
Contact person 1	Evelyn M. Valdez
Contact person 2	Gertrudo Arida
Website	<a href="http://www.philrince.gov.ph/">http://www.philrince.gov.ph/</a>
Number of specimens	Small
The Philippines Rice Research Institute facilities are modern, and the Institute's collection is kept in a centrally air-conditioned office/laboratory. The collection is small. Pinned specimens occupy two high-quality, wooden cabinets. There is also a small number of alcohol vials and about 20 boxes of slide-mounted material.	
<b>Department of Agriculture</b>	
<b>Crop Protection Division (CPMP)</b>	
Suggested Collection Acronym	CPMP
Address	Crop Protection Division Bureau of Plant Industry Department of Agriculture 692 San Andres St Malate Manila 1004
Contact person 1	George Paul S. Karganilla
Phone	+63-02-5240765/+63-02-5258188
Fax	+63-02-5217650
Number specimens	Around 30 150
Contact person 2	Wilma R. Cuaterno, Chief
Phone	+63-02-5247353
Fax	+63-02-5232426
Email	belcpd@edsamail.com.ph

The Crop Protection Division has broad, national responsibilities for the management of insect pests, plant diseases, rodents and weeds. The collection was established in the late 1940s and comprises now about 30 000 pinned specimens, all of which are of agricultural relevance. Specimens have been acquired from crops throughout the Philippines, although in recent times the number of specimens added to the collection each year has slowed markedly. The collection includes some quarantine interceptions from an earlier era. Currently specimens are not lent out. The Division collates pest records received from regional centres, and maintains a database of Philippines' pests in a Microsoft Excel format. Records are mostly of familiar species and voucher specimens are not forwarded routinely to Manila. The collection is housed in large, wooden cabinets. The cabinets contain a mixture of drawers and wooden boxes. The collection resides in a large, timber-panelled room.

<b>National Museum of the Philippines (NPMP)</b>	
Suggested Collection Acronym	NPMP
Address	National Museum of the Philippines, P. Burgos St., Manila, Philippines
Phone	+63-02-5271215
Fax	+63-02-5270306
Email	nmuseum@i-next.net
Contact person 1	Mr. Venancio, U. Samarita
Phone	+63-02-4003239
Fax	+63-02-5270306
Number specimens	121 000
Contact person 2	Ms Elma Naqas
<p>The National Museum insect collection amounts to an estimated 121 000 specimens, including about 108 000 pinned. Specimens have been acquired from all over the Philippines, from natural and managed landscapes, and about 25% of the collection would be of agricultural significance. Specimens are generally well prepared. The collection is stored in a mixture of wooden drawers and store boxes that are either contained in wooden and metal cabinets, or stacked about the collection rooms. The museum lends material to <i>bona fide</i> researchers and allows visiting specialists to study the collections.</p>	

## SINGAPORE

<b>Raffles Museum of Biodiversity Research</b>	
<b>Entomological Collection (ZRC)</b>	
Suggested Collection Acronym	ZRC
Address	Entomological Collection Zoological Reference Collection Raffles Museum of Biodiversity Research Department of Biological Sciences, National University of Singapore (NUS) Kent Ridge Singapore 119260
Website	<a href="http://rnbr.nus.edu.sg/collections/entomology.htm">http://rnbr.nus.edu.sg/collections/entomology.htm</a>
Contact person 1	Mrs Yang Chang Man
Phone	+65-6874-5082/+65-6874-2875
Fax	+65-6774-8101
Email	<a href="mailto:dbsycm@nus.edu.sg">dbsycm@nus.edu.sg</a>
Number specimens	86 500
<p>The Raffles Museum of Biodiversity Research (RMBR) is the largest collection of zoological specimens in Singapore. It is also one of the oldest and most widely known collections in South East Asia. In 1926 the insect collections of the Raffles were transferred from Singapore to the Selangor Museum in Peninsular Malaysia (in exchange for mammal and bird collections) and these insects now form part of the Department of Agriculture Collection, Kuala Lumpur, Malaysia. In 1986 the collections finally were transferred to the present-day quarters on the new campus of the National University of Singapore. The entomological collections of the RMBR comprise approximately 86 000 specimens, 25% of which are relevant to agriculture. Pinned specimens are stored in wooden cabinets and boxes in a separate, entomological collection room. Alcohol-preserved specimens are shelved in a compactus system with the other liquid collections of the Museum. The RMBR has employed a MUSE Database system for vertebrate specimen records and a BRAHMS system for the herbarium, but digitising of the entomological collection has not yet commenced.</p>	

<b>Agri-food &amp; Veterinary Authority of Singapore</b>	
<b>Entomology Laboratory (AVAS)</b>	
Suggested Collection Acronym	AVAS
Address	AVA Plant Health Centre Sembawang Research Station 17 km, Sembawang Rd Singapore 769193
Website	<a href="http://www.ava.gov.sg/JAVASCRIPT/main-ie.html">http://www.ava.gov.sg/JAVASCRIPT/main-ie.html</a>
Contact person 1	Mr He Liansheng
Phone	+65-6752-9835
Fax	+65-6753-4626
Email	He_Lian_Shang@ava.gov.sg
Number specimens	4 000
The AVA maintains a small collection of approximately 4200 specimens, 75% of which are of relevant to agriculture. Most specimens received for identification have been collected by AVA officers during the course of surveillance. A Microsoft Access database has been developed and currently contains about 3000 records.	
<b>Ministry of the Environment</b>	
<b>Environmental Health Institute (EHIS)</b>	
Suggested Collection Acronym	EHIS
Address	The Gemini Block 41 #03-24/28, Science Park II Singapore 117610
Contact person 1	Mrs Lam-Phua Sai Gek
Phone	+65-6771-9126
Email	PHUA_Sai_Gek@env.gov.sg
Number specimens	1 460
The Environmental Health Institute maintains a small collection of approximately 1 460 specimens, principally mosquitoes and cockroaches collected by public health inspectors. In general the Institute's laboratories	

are modern and well equipped.	
<b>National Parks Board</b>	
<b>Singapore Botanic Gardens (SING)</b>	
Address	1 Cluny Rd Singapore 259569
Website	<a href="http://www.nparks.gov.sg">www.nparks.gov.sg</a>
Contact person 1	Ms Cheryl Chia Siew Wah – Research Officer
Phone	+65-6471-9945
Fax	+65-6475-4295
Email	Cheryl_CHIA@NPARKS.GOV.SG
Contact person 2	Ms Chew Ping Ting
Number specimens	2 500
The Singapore Botanic Gardens maintains a small arthropod collection (approximately 2 500 specimens) as an adjunct to its large Herbarium (of over 650 000 specimens) and public displays.	

## THAILAND

<b>National Biological Control Research Center (NBCRC)</b>	
<b>NBCRC Headquarters (BCBT)</b>	
Suggested Collection Acronym	BCBT
Address	NBCRC Headquarters (BCBT) Kasetsart University P.O. Box 9-62 Chatuchak Bangkok 10900 Thailand
Website	<a href="http://www.wisard.org/wisard/shared/asp/generalinfoserver/intermediate.asp?InstitutionID=5780">http://www.wisard.org/wisard/shared/asp/generalinfoserver/intermediate.asp?InstitutionID=5780</a>
Contact person 1	Ms Thitima Thongtab
Phone	+66-02-5793649
Fax	+66-02-9428252
Email	thitithong@yahoo.com
Number specimens	2 600
Contact person 2	Dr Banpot Napompeth – Executive Director NBCRC
Email	agrban@nontri.ku.ac.th
Contact person 3	Dr Weerawan Amornsak
<p>The main NBCRC collection, known as the Natural Enemies Reference Depository (NERD), is housed in an air-conditioned room in modern cabinets. It comprises approximately 740 pinned specimens and 1850 alcohol vials, all relevant to agriculture. The collection is growing at a moderate rate (estimated 100-400 specimens per year) from surveys of field, horticulture, vegetable and forest crops. Specimens are well curated and well labelled. Currently there is a list of the species represented in the collection but no formal database recording label data.</p>	
<b>NBCRC Central Regional Centre (BCCT)</b>	
Suggested Collection Acronym	BCCT
Address	NBCRC Regional Centre Kasetsart University Kamphaeng Saen Campus PO BOX 1 Nakhon Pathom 73140

Contact person 1	Mr Kosol Charernson
Phone	+66-03-428 1265
Fax	+66-03-435 1881
Email	agrkoc@ku.ac.th
Number specimens	7 540
The Central Regional Centre collection comprises approximately 7540 specimens, about half of which have been identified. The collection consists principally of material collected from surveys of sugarcane, pommello, mango and weeds. There is no formal database to the collection.	
<b>NBCRC Northern Regional Centre (BCCM)</b>	
Suggested Collection Acronym	BCCM
Institution	Department of Plant Protection Faculty of Agricultural Production Mae Jo University
Address	NBCRC/ NRC Maejo University, P.O. Box 11, Sansai, Chiang Mai 50290 Thailand
Contact person 1	Mr Charnnarong Doungsa-ard, Assistant Professor
Phone	+66-53-498243
Fax	+66-53-498245
Email	Charn_nbcrc@yahoo.com
Number specimens	Around 1 270
The Centre focuses upon insect pests of fruit trees and other insect pests and weeds in the northern highlands. The Centre maintains a small collection of about 1270 specimens, mostly in alcohol, all of which are of agricultural relevance. Specimens are housed in 5 wooden insect cabinets (total of 100 drawers), and are generally well labelled and secure. Specimens come from surveys of field, vegetable, ornamental and fruit tree crops, and weeds in the northern region of Thailand. There is no database to the collection.	
<b>NBCRC North Eastern Regional Centre (BCKK)</b>	
Suggested Collection Acronym	BCKK
Address	Khon Kaen University PO Box 181 Khon Kaen 40002 Thailand



Contact person 1	Dr Nutcharee Siri, Director
Phone	+66-43-343055
Fax	+66-43-343055
Email	nutcharee@kku.ac.th
Number specimens	Around 630
Contact person 2	Dr. Manochai Keerati-kasikorn
<p>The programs of the North Eastern Regional Centre of NBCRC, on the campus of Khon Kaen University, have emphasised the biological control of insect pests of pulses, rice, crucifers, fruit, sugarcane, tobacco and weeds in the plateau region of north-eastern Thailand. Entomopathogens, including nematodes, are of particular interest to some programs. The Centre's collection comprises slightly more than 600 specimens stored in modern, wooden insect cabinets with glass fronts. Specimens are well prepared and labelled, all of which are of agricultural relevance. Collections of pests and natural enemies are documented in annual reports but the specimens are not databased.</p>	
<b>NBCRC Southern Regional Centre (BCHY)</b>	
Suggested Collection Acronym	BCHY
Address	Faculty of Natural Resources Prince of Songkla University Hat Yai, Songkla 90112 Thailand
Contact person 1	Dr Jiraporn Peteharat
Phone/fax	+66-74-213063
Email	pjirapor@patree.psu.ac.th
Number specimens	Around 800
<p>The collection is conservatively estimated to comprise about 800 specimens. All are of agricultural relevance. Currently most new material comes from surveys of yard long beans, luffa, cucumber, kale and citrus (especially lime, orange and pomello). Pinned specimens are accommodated in six wooden, glass-fronted, insect cabinets, each with 20 drawers. Specimens are pinned directly into the cork bottoms of the drawers. A few vials of alcohol-preserved specimens are also kept in these drawers. The bulk of the alcohol collection is stored in a metal filing cabinet. Specimens are generally well prepared and labelled. Many specimens were reared in NBCRC insectaries and thus provide little information on distribution.</p>	

<b>Department of Agriculture</b>	
<b>Entomology &amp; Zoology Division (EMBT)</b>	
Suggested Collection Acronym	EMBT
Address	Entomology & Zoology Division Department of Agriculture 50 Paholyothin Rd Chatuchak, Bangkok 10900 Thailand
Website	entozoo@doa.go.th
Contact person 1	Mrs Vatana Charanasri, Senior Entomologist
Phone	+66-02-5794128 x176
Fax	+66-02-9405396
Email	vatanac@doa.go.th
Contact person 2	Mrs Wipada Vungsilabutr
Phone	+66-02-5793053
Fax	+66-02-9405396
Number specimens	Approx. 600 000
<p>The arthropod collection of the Department of Agriculture (DOA) is the largest and oldest in Thailand. Currently it comprises over 600 000 specimens, housed in a series of museum and exhibit rooms, in a Ministry building on the Bangkok campus of Kasetsart University. The collection was established in 1931 and the early entomological work of the Department (e.g. insect surveys throughout Thailand, biological studies of pests) centred on the collection. At the present time the collection is maintained principally in wooden insect cabinets and boxes in several air-conditioned rooms. In general the pinned specimens are well curated, well labelled and secure. An impressive array of insects is presented in a public exhibition room associated with collection. Insect diversity and other topics are demonstrated in a series of attractive and informative displays.</p> <p>The mite collection consisting of 14 500 slides, is entirely of agricultural relevance. Between 100 and 400 mites and similar numbers of spiders are received each year for identification. There is no database to the collection but research staff are interested in the development of such a system.</p>	

<b>Royal Forest Department</b>	
<b>Forest Insect Group (RFBT)</b>	
Suggested Collection Acronym	RFBT
Address	61 Paholyothin Rd Chatuchak, Bangkok 10900 Thailand
Website	<a href="http://www.forest.go.th/default_e.asp">http://www.forest.go.th/default_e.asp</a>
Contact person 1	Mr Surachai Chondumrongkul
Phone	+66-02-25614292 x439
Fax	+66-02-25798775
Email	surach@forest.go.th
Number specimens	Approx. 17 400
Contact person 2	Dr Chaweewan Hutacharern, Director of Division
Contact person 3	Mr Supachote Eungwijarnpanya
<p>The Royal Forest Department maintains a collection of approximately 17 400 specimens, comprising 16 400 pinned and 1000 in alcohol. All are relevant to forestry and about 25% to agriculture. Approximately 45% of the collection is unidentified. Pinned specimens are stored in wooden insect cabinets. Specimens are received from field surveys (both plantations and natural forests), various research projects (e.g. collections of termites, ants and other soil insects as part of a land use project), farmers and foresters. A Checklist of the forest insects of Thailand was prepared by Departmental officers and published in 1995. A Microsoft Access database to the collection has been developed. In general the Royal Forest Department collection is well cared for and secure, albeit in cramped conditions.</p>	
<b>Mae Jo University</b>	
<b>Department of Plant Protection (PPMJ)</b>	
Suggested Collection Acronym	PPMJ
Address	Sansai, Chiang Mai 50290 Thailand
Contact person 1	Dr Khayan Surwan – Head of Department
Phone	+66-53-878089

Fax	+66-53-878089
Email	Khayan@mju.ac.th
Number specimens	Around 1 550
<p>The collection occupies about a dozen wooden insect cabinets and a few store boxes. The estimate of over 1500 specimens is conservative. Collections derive largely from surveys of field crops and fruit trees, and from the collections submitted by undergraduates for evaluation. All specimens come from the Northern Region of Thailand and about 50% are relevant to agriculture. There is no database to the collection.</p>	
<b>Chiang Mai University</b>	
<b>Department of Entomology (ECMT)</b>	
Suggested Collection Acronym	ECMT
Address	Faculty of Agriculture Chiang Mai University 50200 Thailand
Website	<a href="http://www.kku.ac.th/kkuinfo/ag.html">http://www.kku.ac.th/kkuinfo/ag.html</a>
Contact person 1	Assoc. Professor Sanit Ratanabhumma, Chairman of Department
Phone	+66-53-944026
Fax	+66-53-944666
Email	headebt@chiangmai.ac.th
Number specimens	About 29 500
Contact person 2	Dr Hans Banziger
Phone	+66-53-944026
Fax	+66-53-944666
Contact person 3	Associate Prof. Vichian Hengsawad
Contact person 4	Dr Manas Titayavan
<p>The Departmental insect collection comprises about 29 500 specimens, mostly pinned. All are of agricultural relevance. Material comes from surveys of vegetable, field crops, flowers, ornamentals, orchards and forests; from collections submitted by undergraduate students for assessment; from field work by academic staff; and by inter-institutional exchange. The collection is not documented and there is no database.</p> <p>The collection is housed in 20 wooden cabinets, each containing 20 drawers. Specimens generally have been well prepared and labelled and represent a significant resource of pest records.</p>	

<b>Khon Kaen University</b>	
<b>Department of Entomology (EKKT)</b>	
Suggested Collection Acronym	EKKT
Address	Faculty of Agriculture Khon Kaen University Khon Kaen 40002 Thailand
Website	<a href="http://www.kku.ac.th/">http://www.kku.ac.th/</a>
Contact person 1	Dr Yupa Hanboonsong, Head of Department of Entomology and Director of Office of International Agriculture.
Phone	+66-43-237602
Fax	+66-43-244474
Email	Yupa_han@kku.ac.th
Contact person 2	Ms Chutinan Choosai
Email	chucho@kku.ac.th
Contact person 3	Dr Sivilai Sirimungkararat
Phone/fax	+66-43-362108
Email	sivilai@mail.kku.ac.th
Number specimens	Around 57 000
<p>The Department maintains an insect collection of over 57 000 specimens of which about 75% are relevant to agriculture. Specimens are added from collections associated with research projects, expeditions, exchanges with other Thai government agencies (e.g. the Royal Forest Department) and surveys of field crops (rice, sugarcane, kenaf, peanuts), fruit crops, natural forests, and animal dung. The bulk of the collection is sorted only to family level. The aphid component of the insect collection amounts to about 60 specimens preserved dry, 30 species in alcohol, and a few slide-mounted specimens. Specimens are stored in wooden cabinets: pinned insects are in unit trays and alcohol vials in racks. Specimens are generally well prepared and well labelled.</p>	

<b>Prince of Songkla University</b>	
<b>Department of Pest Management (PMHY)</b>	
Suggested Collection Acronym	PMHY
Address	Faculty of Natural Resources, Prince of Songkla University, Hat Yai, Songkhla 60112
Website	<a href="http://natres.psu.ac.th/">http://natres.psu.ac.th/</a>
Contact person 1	Dr Sieng Kritsaneepaiboon, Dean for Faculty of Natural Resources
Phone	+66-74-211122
Fax	+66-74-212823
Email	ksieng@ratree.psu.ac.th
Contact person 2	Dr Prawit Towatana, Associate Dean for Research and International Relations
Phone	+66-74-282300
Fax	+66-74-211122
Email	tprawit@ratree.psu.ac.th
Contact person 3	Dr Surakra Permkam
Phone	+66-74-212844
Fax	+66-74-212823
Email	psurakra@ratree.psu.ac.th
Number specimens	Around 22 000
Contact person 4	Dr. Aran Ngampongsai
<p>The Departmental collection is conservatively estimated at comprising something over 21 000 mostly-pinned specimens, about 25% of which are relevant to agriculture. Material is added to the collection according to the research interests of staff and via collections submitted by undergraduates for assessment. Pinned specimens are kept in store boxes shelved in approximately 25 wooden, wardrobe-like cupboards. There is no database to the collection.</p>	
<b>Faculty of Agriculture, Kasetsart University</b>	
<b>Department of Entomology (AKBT)</b>	
Suggested Collection Acronym	AKBT

Address	Faculty of Agriculture, Kasetsart University 50 Paholyothin Road Bangkok 10900 THAILAND
Website	<a href="http://www.ku.ac.th/aboutku/thai/faculty/agr/mento.htm">http://www.ku.ac.th/aboutku/thai/faculty/agr/mento.htm</a> (in Thai) <a href="http://www.ku.ac.th/faculty/agri/indexe.html">http://www.ku.ac.th/faculty/agri/indexe.html</a>
Contact person 1	Weerawan Amornsak, Assistant Professor
Phone	+66-02-5790113 x3694
Fax	+66-02-34351886
Email	agrwwa@notri.ku.ac.th agrwwa@ku.ac.th
Contact person 1	Assoc. Professor Chitapa Ketavan, Dept Head
Phone	+66-02-5613478
Fax	+66-02-5620985
Email	agrchk@nontri.ku.ac.th
Number specimens	More than 200 000
<p>The Department maintains an insect collection of over 200 000 pinned specimens, 5000 vials and 12 000 slides. About 75% of these specimens are relevant to agriculture. The collection is housed in storage cabinets. The collection is not documented; there is no database and no list of type material. The collection continues to grow by 100-400 specimens annually, from surveys of rice, sugarcane, maize, cotton, vegetable and ornamental crops. Undergraduates each submit a collection representing 60 identified insect families for assessment and some specimens from these collections are transferred to the Departmental reference collection. Generally specimens in the collection are well labelled and prepared.</p>	

## VIETNAM

<b>National Institute of Plant Protection (NIPP)</b>	
Suggested Collection Acronym	NIPP
Address	National Institute of Plant Protection Ministry of Agriculture and Rural Development Dong Ngac Tu Liem Hanoi, Vietnam
Contact person 1	Prof. Nguyen Van Tuat
Phone	+84-804-8385578, +84-804-8389724
Fax	+84-804-8363563
Email	Nipp.Vietnam@bdvn.vnmail.vnd.net tuat@hn.vnn.vn
Contact person 2	Dr. Nguyen van Cam, former Director
Phone	+84-804-48362393
Fax	+84-804-48363563
Email	Bio-nipp@hn.vnn.vn vietnam@bdvn.vnmail.vnd.net
Contact person 3	Dr. Pham van Lam, entomologist
Phone	+84-804-8362393
Fax	+84-804-8363563
Email	Bio-nipp@hn.vnn.vn
Contact person 4	Dr Quach Thi Ngo, Curator
Phone	+84-804-8362393
Fax	+84-804-8363563
Contact person 5	Ms Nguyen Thi Mai Chi
Number specimens	Approx. 40 000
<p>NIPP is the most important repository of information on arthropod pests of agriculture in Vietnam. NIPP maintains a collection of perhaps about 100 000 pinned arthropod specimens and about 15 000 specimens in alcohol. The collection can be divided into three distinct eras, reflecting Vietnam's twentieth century history:</p> <ol style="list-style-type: none"> <li>1) "Colonial era";</li> <li>2) "Chinese era"; and</li> <li>3) "Modern era".</li> </ol>	



<p>Some of the modern era specimens derive from surveys of citrus and rice, the results of which were published. Some specimens are stored in good, metal insect cabinets, purchased from Australia. Large unit trays with balsa bottoms are preferred. There are also several small, "satellite" collections in nearby laboratories. Among these is a well-curated collection of fruit flies. There is also a very small slide collection comprising about 170 specimens. The NIPP collection is not as well known as that at IEBR and rarely loans specimens to taxonomists or other researchers.</p>	
<b>Forest Science Institute of Vietnam (FSIV)</b>	
Suggested Collection Acronym	FSIV
Address	Dong Ngac Tu Liem Hanoi, Vietnam
Contact person 1	Mr Nguyen Van Do, Entomologist
Phone	+84-804-48362376
Fax	+84-804-48389722
Email	pbvr@hn.vnn.vn
Number specimens	14 270
Contact person 2	Dr. Nguyen Hoang Nghia, Deputy Director General
Phone	+84-804-913236028
Fax	+84-804-8389722
Email	nhnghia@netnam.vn
Contact person 3	Dr Pham Quang Thu, Head of Forest Protection Research Division
Phone	+84-804-8362376
Fax	+84-804-8389722
Email	pbvr@hn.vnn.vn
<p>The Institute has a small collection of about 6 750 pinned specimens, some from collaborative work on eucalypt and Acacia pests in region. Some of the specimens from these surveys remain overseas. The collection resides mostly in an air-conditioned room in about 25 store boxes that are kept in an oven. The alcohol collection comprises about 7 500 specimens; there is no slide collection. There is a good microscope with a digital camera.</p>	

<b>Hanoi Agricultural University (HAUV)</b>	
Suggested Collection Acronym	HAUV
Address	Trauquy Gia Lam District Hanoi, Vietnam
Contact person 1	Dr Nguyen Van Dinh, Head of Planning Division
Phone	+84-804-8276473
Fax	+84-804-8276473
Email	agronomy@hn.vnn.vn
Contact person 2	Prof. H.A Quang Hung
Phone	+84-804-8768039
Fax	+84-804-8276554
Email	hunghuong@fpt.vn
Contact person 3	Dr. Nguyen Kim Van, Head Department of Plant Pathology and Agro-Pharmacology
Phone	+84-804-8768475
Fax	+84-804-8276554
Email	agronomy@hn.vnn.vn vtman@hn.vnn.vn
Number specimens	Around 5 000
<p>The Department's reference collection is small (probably fewer than 5 000 specimens) and is more representative of larger arthropods, such as butterflies and dragonflies, than the smaller groups. Specimens are in excellent condition, well labelled and housed in new, metal cabinets manufactured in Japan and purchased with Japanese assistance. The cabinets occupy an air-conditioned room in a central university building remote from the Department of Entomology.</p>	
<b>Institute of Ecology and Biological Resources (IEBR)</b>	
Suggested Collection Acronym	IEBR
Address	Institute of Ecology and Biological Resources Nghia Do – Cau Giay, Hanoi, Vietnam
Contact person 1	Prof. Vu Quang Con, Director
Phone	+84-804-8361441
Fax	+84-804-8361196

Email	vucon@ncst.ac.vn
Contact person 2	Dr Le Xuan Canh, Vice Director
Phone	+84-804-8360870
Fax	+84-804-8361196
Email	Lxcanh@ncst.ac.vn
Contact person 3	Mrs Le Khuong Thuy
Contact person 4	Dr Tran Minh Hoi, Vice Director
Phone	+84-804-7565942
Email	tranhoid@iebr.ncst.ac.vn
Contact person 5	Dr. Bui Tuan Viet
Email	btviet@iebr.ncst.ac.vn
Number specimens	In excess of 100 000
<p>The IEBR maintains the largest arthropod collection in Vietnam. Over the past 12 years the Institute has carried out numerous biological surveys of various regions of Vietnam, assembled impressive zoological and botanical collections, and initiated an ambitious program of descriptive publications. The IEBR arthropod collection is distributed among several research groups. Its overall size is difficult to estimate but would be in excess of 100 000 specimens. Most specimens have been collected in recent years, are well prepared and have good provenance data on modern, machine-printed labels. The majority of specimens have been mass collected during surveys. The collection shows evidence of international collaboration with identifications performed with the assistance of respected European and North American specialists.</p> <p>The oldest part of the entomological collection is housed, along with a very large collection of vertebrate specimens, in antique wooden cabinets in an older building.</p>	

## REFERENCES

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**MAP OF SOUTH EAST ASIA & LOCATIONS OF  
ARTHROPOD COLLECTIONS**

