



## **Inventory List: CGIAR Non-Plant Taxa Collections**

**Compiled by Muris Korkaric, as the result of the Non-plant Taxa Survey**

Date: March 2010



# CGIAR System-wide Genetic Resources Programme

Collective Action for the Rehabilitation of Global Public Goods in the CGIAR Genetic Resources System: Phase 2:

**Activity:** 5.2 - Survey of available microbial, fungal, insect and nematode collections and analysis of the CGIAR's comparative advantage for involvement in their management.

**Sub-Activity:** 5.2.1 - Survey of collections within the System and in international repositories.

**Sub-Activity:** 5.2.2 - Recommendations on options and policies for conserving microbial, fungal, insect and nematode collections.

## Inventory List: CGIAR non-plant taxa collections

The following inventory lists 32 non-plant taxa collections (29 CGIAR collections and 3 CGIAR associated collections), of which 26 completed the GPG2 non-plant taxa survey. These 26 collections hold the following number of specimen:

Taxa	Number of specimen	% living specimens	Number of Collections holding these specimens
Insects	~420.000	>0.6	6
Fungi	~17.228	100	14
Bacteria	23.245	100	12
Viruses	156	100	4
Nematodes	113	>64	5
Living Cells	12429	>88	2
Others	167	100	1

The information presented in this inventory list has been collected through the GPG2 non-plant taxa survey and email correspondence.

The following pro forma is used to present the data for each collection

Abbreviation used: **L = Living; N = Non-living; A = Available; C = Catalogued**

<b>Centre – Unit</b>		
<b>Address</b>	...	
<b>Contact</b>	Name email	
<b>Collection</b>	<b>Taxon</b>	<b>Number of specimens (living, non living, catalogued, availability)</b>
<i>Additional information</i>		
<b>Constraints</b>	<b>Major area of need as identified through survey (e.g. Funding, Accessibility)</b>	
	- ...	

## CIAT - Centro Internacional de Agricultura Tropical

<i>CIAT - Collection of rhizobium strains for tropical forage legumes and common bean</i>		
<b>Address</b>	Apartado aereo 6713 – CIAT – Cali, Colombia, South America	
<b>Contact</b>	Idupulapati Rao - <a href="mailto:I.RAO@CGIAR.ORG">I.RAO@CGIAR.ORG</a> Neuza Asakawa - <a href="mailto:nasakawa@cgiar.org">nasakawa@cgiar.org</a>	
<b>Collection</b>	<b>Bacteria</b>	<b>5651</b> (Living species catalogued)
<p><b><i>Current status of rhizobium strains for tropical forage legumes</i></b></p> <p>The collection contains 5088 rhizobium strains for tropical forage legumes, with several sets for each strain. The strains are maintained as freeze-dried samples and stored at room temperature. The purity of the strains has been evaluated and new sets have been regenerated and stored until 2007, but these regular maintenance activities were stopped because the one permanent full-time staff position was phased out due to restrictions on core funds. At present, based on research demands within CIAT and from its partners, a few strains are being used to prepare inoculants and these strains are regenerated and freeze-dried.</p> <p>These strains are classified in growth categories according to appearance and consistency of colonies on Yeast-Mannitol-Agar medium and acid or alkaline reaction on medium. It is very important to identify and classify the strains into different genera using recent molecular techniques.</p> <p><b><i>Current status of rhizobium strains for common bean</i></b></p> <p>The collection contains 563 Rhizobium strains collected from different germplasm accessions and varieties of <i>Phaseolus vulgaris</i> both cultivated and wild. A total of 464 strains are from Colombia and the rest are from other countries. All strains are maintained as freeze-dried samples.</p> <p><b><i>CIAT collection of mycorrhizae</i></b></p> <p>CIAT collection of mycorrhizae was introduced by Dr Ewald Sieverding between 1980 and 1986, and it represented the most rich collection from the tropical areas of Latin America. The original collection included 1600 entries and when the catalogue was published by CIAT in the year 2000 it had 1204 entries that represent 44 species from 6 genera (<i>Acaulospora</i>, <i>Entrophospora</i>, <i>Gigaspora</i>, <i>Glomus</i>, <i>Sclerocystis</i>, <i>Scutellospora</i>). The present collection includes also 26 pure strains (several species from 6 genera mentioned above) that were bought from INVAM (International Culture Collection of VA Mycorrhizal Fungi) to use as reference strains.</p> <p>The entries are stored as soil and root cuttings of the trap culture in plastic pot and maintained at room temperature (Dr. E. Sieverding, personal communication). The collection was maintained well through regeneration of the strains until the year 2001. Until 2007 the collection was continued to be used for research purposes and providing inoculants for CIAT researchers and their partners. Since 2007 the maintenance activities of the collection were stopped due to the elimination of the research support staff position. At present, the collection contains 393 entries but the viability of several strains is to be determined.</p>		
<b>Constraints</b>	<p><b>Funding, Staffing, Maintenance</b></p> <ul style="list-style-type: none"> <li>- Collection size is reducing in size</li> <li>- Staffing has been reduced through layoffs and elimination of positions</li> <li>- Unit expects to lay off staff and eliminate positions</li> <li>- Lack of characterization/added value, but staff is missing for maintenance and further characterization</li> </ul>	

<i>CIAT - collection of Arthropods*</i>		
<b>Address</b>	-	
<b>Contact</b>	Daniel Debouck - <a href="mailto:D.DEBOUCK@CGIAR.ORG">D.DEBOUCK@CGIAR.ORG</a>	
<b>Collection</b>	<b>Insects</b>	<b>&gt;20.000 (?)</b>
<p>CIAT maintains a working collection of arthropods (insects and mites) associated with CIAT's main commodities, cassava, beans, rice, tropical pastures and tropical fruits. The collection consists of both pest species and beneficials. There are more than 20,000 specimens in the collection and these have been collected from numerous countries, primarily in the Neotropics. In addition, there is a collection of</p>		

entomopathogens maintained at CIAT.

**\*=no survey, information from email correspondence**

### **CIAT - TSBF - Nairobi, Kenya \***

**Address** TSBF-CIAT; ICRAF Campus  
UN Avenue, Gigiri; P.O. Box 30677-00100  
Nairobi, Kenya; - Phone: +254 20 7224777

**Contact** Laetitia Herrmann - *L.Herrmann@cgiar.org*

**Collection** **Bacteria** ~500 (?)

Collection of strains are composed of bacterial strains that have been isolated from nodules (from different legumes), soils (different agro-ecological zones in Kenya) or from commercial products (which are supposed to improve plant growth) that we test in the frame of a project funded by Bill and Melinda Gate Foundation.

We have about 500 strains, but very few of them are sequenced since most of the strains have been isolated from the commercial products and we are still working on them.

**\*=no survey, information from email correspondence**

## **CIMMYT- The International Maize and Wheat Improvement Center**

### **CIMMYT - Global Wheat Program – D.F., Mexico**

**Address:** D. F. Mexico; AP-Postal 6-641

**Contact** Etienne Duveiller - *E.Duveiller@cgiar.org*

**Collection** **Fungi** 360 (Living species available)

CIMMYT keeps a series of races of rusts for our wheat screening purposes and studies. Units have strains of several other wheat pathogens (i.e. *Fusarium*, *Septoria*...) and related species for their breeding efforts on other disease traits. These samples are all from Mexico since they are not able to work with alien strains. It is more a working collection for breeding purpose.

Several collaborative projects conducted in the past with CIMMYT have allowed us to accumulate broader collections of foliar wheat pathogens for instance for *Cochliobolus sativus* and *Pyrenophora tritici-repentis*. For the obvious reasons explained above, these strains are not kept in Mexico but are in working collections with the respective project collaborators or registered in repositories like the MUCL-BCCM.

**Constraints** **Funding, Facilities, Preservation, Accessibility**

- Project based funding; "We do not have enough core money to keep our staff"
- Erosion of funding expected
- current space allocation is barely adequate
- Objects in these collection areas are accessible but they are deteriorating due to inadequate facilities and/or building systems
- Collections have been cataloged but their labeling and preservation materials are unacceptable
- Collections lack important specimen data (locality, taxonomic name) and they are preserved with substandard materials that are causing damage to them.
- Lack of long term preservation methods
- Collection neither catalogued, computerized nor web accessible

<b>CIMMYT - Turkey*</b>				
<b>Address:</b>	?			
<b>Contact</b>	Julie Nicol - <a href="mailto:j.nicol@cgiar.org">j.nicol@cgiar.org</a>			
<b>Collection</b>	<b>Fungi</b>	<b>12</b>	<b>Nematodes</b>	<b>10</b>
<p>The Soil Borne Pathogen program on wheat includes Cereal Nematodes and Dryland Root Rots and holds a limited collection of both Cereal Cyst Nematode (Heterodera spp; around 10 populations), and for Crown Rot (F. Culmorum &amp; F. Psuedograminearum; around 12 populations) in Turkey.</p> <p>Both of these collections are housed within the National Program Structure as they do not have a laboratory as such and therefore work 100% in collaboration with National Program partners.</p>				

\*=no survey, information from email correspondence

<b>CIMMYT*</b>				
<b>Contact</b>	George Mahuku - <a href="mailto:G.Mahuku@cgiar.org">G.Mahuku@cgiar.org</a>			
<b>Collection</b>	<b>Fungi</b>	---	<b>Bacteria</b>	---
<p>George Mahuku just started in CIMMYT and is still updating the fungal and bacterial collections that we have for maize.</p>				

\*=no survey

## ***CIP - International Potato Center***

<b>CIP - Peru</b>				
<b>Address</b>	La Molina 1895; Lima; Peru			
<b>Contacts</b>	Enrique Chujoy <a href="mailto:echujoy@cgiar.org">echujoy@cgiar.org</a> Greg Forbes <a href="mailto:g.forbes@cggmail.org">g.forbes@cggmail.org</a> Perez, Wilmer (CIP) <a href="mailto:W.PEREZ@CGIAR.ORG">W.PEREZ@CGIAR.ORG</a>			
<b>Sets of samples</b>	<b>Insects</b>	<b>20000 (N, C); 12 (L, C)</b>		
	<b>Fungi</b>	<b>1207 (L, C)</b>	<b>Bacteria</b>	<b>194 (L, C)</b>
	<b>Viruses</b>	<b>76 (L, C)</b>	<b>Nematodes</b>	<b>43 (L, C)</b>
<p>CIP keeps 3 working collections corresponding to insects and nematodes; viruses; and fungi and bacteria. These consist of germplasm samples acquired on research needs basis primarily, as there was no intention to make an exhaustive collection of the various species germplasm. The 3 working collections are maintained by 3 different staff groups. The distribution of the non-plant taxa is done through the Germplasm Acquisition and Distribution Unit and is accompanied by the <u>MTA for non-plant material</u>.</p>				
<u>Viruses/viroid :</u>		<u>Bacteria:</u>		
> Virus	64	> Phytopathogenic	440	
> Viroid	1	> Beneficial	257	
> Phytoplasma	2			

<u>Oomycete:</u> > Phytophthora infestans                      1042		<u>Nematodes:</u> > Entomopathogen                                      42	
Insects: > No living ("museum")                      500 (400 non identified)			
All CIP's collections are under the purview of International and national regulations. All collections are managed and administrated according international standards.			
<b>Constraints</b>	<b>Maintenance, Funding, Preservation, Accessibility</b> <ul style="list-style-type: none"> <li>- Current staff can handle routine activities and maintenance of the collections</li> <li>- Erosion of funding expected</li> <li>- For parts of collection, the labeling and preservation materials are unacceptable.</li> <li>- Collection is catalogued, database computerized but not web accessible</li> </ul>		

<i>CIP - International Potato Center, Lima, Peru*</i>		
<b>Address</b>	La Molina 1895; Lima; Peru	
<b>Contact</b>	A. Oswald <a href="mailto:a.oswald@cgiar.org">a.oswald@cgiar.org</a>	
<b>Collection</b>	<b>Bacteria</b>	<b>300</b> (living specimen available)
Collection of rhizobacteria of the genera Bacillus, Azotobacter, Pseudomonas, Azospirillum and Actinomycetes not with Rhizobium. The work started in 2005 and unit evaluated about 300 bacteria for their plant growth promoting characteristics. <u>The objective of collection is the use of the bacteria, not implementing a collection.</u>		
<b>Constraints</b>	<b>Long term Funding, Accessibility</b> <ul style="list-style-type: none"> <li>- All activities are financed by special projects</li> <li>- Characterization according to project needs/ no further added value</li> <li>- Collection not catalogued, computerized or web accessible</li> </ul>	

\*Possibly overlapping with the other collection.

## ***ICARDA - International Center for Agricultural Research in the Dry Areas***

<i>ICARDA - Aleppo</i>		
<b>Address</b>	Damascus Road; 5644; Aleppo, Syria	
<b>Contact</b>	Seid A. Kemal - <a href="mailto:s.a.kemal@cgiar.org">s.a.kemal@cgiar.org</a>	
<b>Collection</b>	<b>Fungi</b>	<b>400</b> fungi living, available
<b>Constraints</b>	<b>Funding, Facilities, Characterization, Accessibility</b> <ul style="list-style-type: none"> <li>- Special project based funding</li> <li>- Current space allocation is inadequate.</li> <li>- Lack in characterization/added value</li> <li>- Database is computerized but not web accessible</li> </ul>	

<b>ICARDA - Aleppo*</b>	
<b>Address</b>	Damascus Road; 5644; Aleppo, Syria
<b>Contact</b>	Safaa. Kumari <i>s.kumari@cgiar.org</i>
<b>Collection</b>	<b>Viruses</b>
<p>Collection of viruses affecting food legumes and cereals that is currently held by ICARDA. These viruses are:</p> <p>Food legume viruses: <i>Faba bean necrotic yellows virus, Bean leafroll virus, Bean yellow mosaic virus, Broad bean stain virus, Broad bean mottle virus, Cucumber mosaic virus, Alfalfa mosaic virus, Soybean dwarf virus, Beet western yellows virus, Pea seed-borne mosaic virus</i> and <i>Chickpea chlorotic dwarf virus</i>.</p> <p>Cereal viruses: <i>barley yellow dwarf virus, Barley stripe mosaic virus, Barley yellow striate mosaic virus</i> and <i>Wheat streak mosaic virus</i>.</p>	

\*=no survey, information obtained from email correspondence

<b>ICARDA - IPM-BIGM Program</b>	
<b>Address</b>	Damascus Road; 5644; Aleppo, Syria
<b>Contact</b>	Mustapha El Bouhssini - <i>M.Bohssini@cgiar.org</i>
<b>Collection</b>	<b>Fungi</b> <b>260</b> (living, catalogued)
<p>Please note that we hold and maintain at ICARDA a collection of some 250 entomopathogenic fungal isolates. These isolates were collected from Sunn pest (<i>Eurygaster integriceps Puton</i>) adults in West and Central Asia. Most of the isolates are <i>Beauveria bassiana</i>.</p>	
<b>Constraints</b>	<b>Funding, Accessibility</b> <ul style="list-style-type: none"> <li>- Special project based funding</li> <li>- Collection is catalogued; database computerized but not web accessible</li> </ul>

<b>ICARDA - Genetic Resources Section</b>	
<b>Address:</b>	Damascus Road; 5644; Aleppo, Syria
<b>Contact</b>	J.Konopka - <i>J.Konopka@cgiar.org</i>
<b>Collection</b>	<b>Bacteria</b> <b>1853</b> (Rhizobia; living available and catalogued)
<b>Constraints</b>	<b>Staffing, Preservation, Characterization, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing is declining due to attrition and elimination of positions</li> <li>- Collection lacks important specimen data (locality, taxonomic name) and they are preserved with substandard materials that are causing damage to them.</li> <li>- Lack in characterization/added value</li> <li>- Collection is catalogued; database computerized but not web accessible</li> </ul>

**Additional details on ICARDA non-plant taxa collections at the end o the inventory list**

**ICRISAT - International Crops Research Institute for the Semi-Arid Tropics**

<i>ICRISAT - Cereals Pathology</i>				
<b>Address</b>	ICRISAT P.O.; Patancheru; Hyderabad; Andhra Pradesh, India			
<b>Contact</b>	Ram P Thakur - <a href="mailto:r.thakur@cgiar.org">r.thakur@cgiar.org</a>			
<b>Collection</b>	<b>Fungi</b>	<b>8</b> (L, C)	<b>Viruses</b>	<b>2</b> (L, C)
<b>Constraints</b>	<b>Staffing, Funding, Characterization, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing has been reduced through layoffs and elimination of positions</li> <li>- Project based funding</li> <li>- Lack in characterization/added value</li> <li>- Database computerized but not web accessible</li> </ul>			
<i>ICRISAT - Legumes Pathology</i>				
<b>Address</b>	ICRISAT P.O.; Patancheru; Hyderabad; Andhra Pradesh, India			
<b>Contact</b>	Mamta Sharma - <a href="mailto:mamta.sharma@cgiar.org">mamta.sharma@cgiar.org</a>			
<b>Collection</b>	<b>Fungi</b>	<b>9</b> (living, available)		
<b>Constraints</b>	<b>Funding, Characterization, Preservation</b> <ul style="list-style-type: none"> <li>- Project based funding</li> <li>- Lack in characterization/added value</li> <li>- Preservation method not suitable for long term storage</li> </ul>			

<i>ICRISAT - Biocontrol unit</i>				
<b>Address</b>	ICRISAT P.O.; Patancheru; Hyderabad; Andhra Pradesh, India			
<b>Contact</b>	S Gopalakrishnan - <a href="mailto:S.GOPALAKRISHNAN@CGIAR.ORG">S.GOPALAKRISHNAN@CGIAR.ORG</a>			
<b>Collection</b>	<b>Bacteria</b>	<b>17</b> (living, available)		
<b>Constraints</b>	<b>Funding, Facilities, Accessibility</b> <ul style="list-style-type: none"> <li>- Project based funding</li> <li>- Significant funding cuts expected</li> <li>- Current space allocation is barely adequate</li> <li>- Collection is catalogued; database computerized but not web accessible</li> </ul>			

<i>ICRISAT - Entomology-HPR</i>				
<b>Address</b>	ICRISAT P.O.; Patancheru; Hyderabad; Andhra Pradesh, India			
<b>Contact</b>	Dr HC Sharma - <a href="mailto:H.Sharma@cgiar.org">H.Sharma@cgiar.org</a>			
<b>Collection</b>	<b>Insects</b>	<b>5025</b> (25 living, catalogued, 5000 non-living catalogued)		
<b>Constraints</b>	<b>Staffing, Funding, Preservation, Documentation, Accessibility</b> <ul style="list-style-type: none"> <li>- Current staff cannot handle routine activities and maintenance of the collections</li> <li>- Staffing is declining due to attrition and elimination of positions</li> <li>- Unit expects to lose positions as people move or retire</li> <li>- Erosion of funding expected</li> <li>- Objects in collection are accessible but their scientific value is diminished by their level of curation/preservation</li> <li>- Collection lacks important specimen data (locality, taxonomic name) and they are preserved with substandard materials that are causing damage to them.</li> <li>- Collection is neither catalogued, computerized nor web accessible</li> </ul>			

## IITA- International Institute of Tropical Agriculture

<i>IITA - Biodiversity Centre, Benin</i>				
<b>Address</b>	IITA – Benin; BP 08-0932, Cotonou, Benin			
<b>Contact</b>	Georg Goergen - <a href="mailto:g.goergen@cgiar.org">g.goergen@cgiar.org</a> ;			
<b>Collection</b>	<b>Insects</b>	<b>360.000</b> (N, A, C)	<b>2500</b> (L, A, C)	
	<b>Fungi</b>	<b>901</b> (L, A, C)	<b>Bacteria</b>	<b>66</b> (L, A, C)
	<b>Living Cells</b>	<b>9</b> (L, A, C)	<b>Viruses</b>	<b>36</b> (L, A, C)
<b>Constraints</b>	<b>Staffing, Funding, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing has been reduced through layoffs and elimination of positions</li> <li>- Project based funding</li> <li>- Significant funding cuts expected</li> <li>- Collection is catalogued, database computerized but not web accessible</li> </ul>			

<i>IITA - Nematology unit, Cotonou, Benin*</i>				
<b>Address</b>	IITA – Benin; BP 08-0932, Cotonou, Benin			
<b>Contact</b>	Danny Coyne - <a href="mailto:d.coyne@cgiar.org">d.coyne@cgiar.org</a>			
<b>Collections</b>	<b>Fungi</b>	<b>32</b> (6 living, available; 26 living, catalogued)		
	<b>Bacteria</b>	<b>1</b> (L, A, C)	<b>Nematodes</b>	<b>3</b> (L, A, C)
<b>Constraints</b>	<b>Staffing, Preservation, Accessibility</b> <ul style="list-style-type: none"> <li>- Staff in need of training for basic collection activities</li> <li>- Project based funding</li> <li>- Collections have been catalogued but their labeling and preservation materials are unacceptable</li> <li>- Collection is catalogued, but no computerized database</li> </ul>			

<i>IITA - Cereal-legume IPM, Benin</i>				
<b>Address</b>	IITA – Benin; BP 08-0932, Cotonou, Benin			
<b>Contact</b>	Manuele Tamo - <a href="mailto:m.tamo@cgiar.org">m.tamo@cgiar.org</a>			
<b>Collection</b>	<b>Insects</b>	<b>15</b> (L, A)	<b>Fungi</b>	<b>6</b> (L, A)
	<b>Viruses</b>	<b>3</b> (L, A)		
Live collections IITA-Benin (Manuele Tamò):  Pod borer <i>Maruca vitrata</i> (Lep.: Crambidae) Parasitoid <i>Phanerotoma leucobasis</i> (Hym.: Braconidae) Parasitoid <i>Apanteles taragamae</i> (Hym.: Braconidae) Parasitoid <i>Braunsia kriegeri</i> (Hym.: Braconidae) Parasitoid <i>Trichogrammatoidea eldanae</i> (Hym.: Trichogrammatidae) Entomopatogenic baculovirus <i>Maruca vitrata</i> Multiple Nucleopolyhedrovirus ( <i>Mav</i> /MNPV)  Flower thrips <i>Megalurothrips sjostedti</i> (Thys.: Thripidae) Parasitoid <i>Ceraninus femoratus</i> (Hym.: Eulophidae)  The groundnut aphid <i>Aphis craccivora</i> (Hom.: Aphidae) Parasitoid <i>Lysiphlebus testaceipes</i> (Hym.: Aphididae)				

Brown coreid bug *Clavigralla tomentosicollis* (Het.: Coreidae)  
Parasitoid *Gryon fulviventre* (Hym.: Scelionidae)

Cotton bollworm *Helicoverpa armigera* (Lep.: Noctuidae)  
Parasitoid *Habrobracon brevicornis* (Hym.: Braconidae)

<b>Constraints</b>	<b>Staffing, Preservation, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing has been reduced through layoffs and elimination of positions</li> <li>- Objects in these collection areas are accessible but they are deteriorating due to inadequate facilities and/or building systems</li> <li>- Computerized database is not web accessible</li> </ul>
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### *IITA – Pathology, Ibadan*

<b>Address</b>	P.M.B. 5320; Ibadan; Oyo State; Nigeria	
<b>Contact</b>	Ranjit Bandyopadhyay - <a href="mailto:r.bandyopadhyay@cgiar.org">r.bandyopadhyay@cgiar.org</a>	
<b>Collection</b>	<b>Fungi</b>	<b>11000</b> (living, available; 8000 catalogued)
	<b>Bacteria</b>	<b>20</b> (living, available and catalogued)
<b>Constraints</b>	<b>Staffing, Preservation, Accessibility</b> <ul style="list-style-type: none"> <li>- Collection expects to lose positions as people move or retire</li> <li>- In need of training for basic collection activities</li> <li>- Funding expected to erode</li> <li>- Collection areas are cataloged but their labeling and preservation materials are not optimal. They are accessible but their scientific value is diminished by their level of curation/preservation.</li> <li>- Collection is partially catalogued; Database is not web accessible</li> </ul>	

### *IITA - Nematology unit, Ibadan*

<b>Address</b>	P.M.B. 5320; Ibadan; Oyo State; Nigeria	
<b>Contact</b>	Adewuyi Wumi (Nee Popoola) - <a href="mailto:wpopoola@cgiar.org">wpopoola@cgiar.org</a>	
<b>Collection</b>	<b>Nematodes</b>	<b>7</b> (living, available)
<b>Constraints</b>	<b>Staffing, Documentation, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing is declining</li> <li>- In need of training_for basic collection activities</li> <li>- Collection is partially catalogued; Database is computerized but not on the web</li> </ul>	

### *IITA – Pathology, Ibadan*

<b>Address</b>	P.M.B. 5320; Ibadan; Oyo State; Nigeria	
<b>Contact</b>	Lava Kumar - <a href="mailto:L.Kumar@cgiar.org">L.Kumar@cgiar.org</a>	
<b>Collection</b>	<b>Viruses</b>	<b>21</b> (living, catalogued)
<b>Constraints</b>	<b>Staffing, Facilities, Preservation, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing is declining</li> </ul>	

	<ul style="list-style-type: none"> <li>- In need of training for basic collection activities</li> <li>- Funding is project based</li> <li>- Space allocation barely adequate</li> <li>- Objects in collection are accessible but they are deteriorating due to inadequate facilities and/or building systems</li> <li>- Collection areas are cataloged but their labeling and preservation materials are not optimal. They are accessible but their scientific value is diminished by their level of curation/preservation.</li> <li>- Collection neither computerized nor web accessible</li> </ul>
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<b>IITA – Soil Microbiology unit, Ibadan*</b>	
<b>Address</b>	P.M.B. 5320; Ibadan; Oyo State; Nigeria
<b>Contact</b>	Robert Abaidoo - R.ABAIDOO@CGIAR.ORG
<b>Collection</b>	<b>Bacteria</b> ?
Dr. Robert Abaidoo keeps a collection of Rhizobia.	

**\*no survey obtained**

<b>IITA - Nematology unit, Uganda</b>	
<b>Address</b>	IITA. Namulonge, PO Box 7878, Uganda
<b>Contact</b>	Danny Coyne - <a href="mailto:d.coyne@cgiar.org">d.coyne@cgiar.org</a>
<b>Collection</b>	<b>Fungi</b> 7 (L, A) <b>Bacteria</b> 2 (L, A)
	<b>Nematodes</b> 50 (10 living available, 40 slides)

List of available Non plant taxa in Uganda and Benin Nematology Units, IITA Stations can be obtained from Danny Coyne [d.coyne@cgiar.org](mailto:d.coyne@cgiar.org)

<b>Constraints</b>	<b>Funding, Facilities, Preservation, Characterization, Accessibility</b> <ul style="list-style-type: none"> <li>- In need of training for basic collection activities</li> <li>- Funding is project based</li> <li>- Space allocation barely adequate</li> <li>- Objects in collection are accessible but they are deteriorating due to inadequate facilities and/or building systems</li> <li>- Collection lacks important specimen data (locality, taxonomic name) and they are preserved with substandard materials that are causing damage to them.</li> <li>- Lack of characterization</li> <li>- Collection is partially catalogued; Database is computerized but not on the web</li> </ul>
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<b>IITA - Uganda, Namulonge</b>	
<b>Address</b>	IITA. Namulonge, PO Box 7878, Uganda
<b>Contact</b>	Thomas Dubois - <a href="mailto:t.dubois@cgiar.org">t.dubois@cgiar.org</a>
<b>Collection</b>	<b>Fungi</b> 100 (L, C) <b>Nematodes</b> 10 (L, C)
<b>Constraints</b>	<b>Staffing, Funding, Documentation, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing is declining and is expected to be laid off</li> <li>- Funding is project based</li> <li>- Significant funding cuts expected</li> <li>- Collection is neither catalogued, computerized or web accessible</li> </ul>

## ***ILRI - International Livestock Research Institute***

<b><i>ILRI - Biological services</i></b>		
<b>Address</b>	Naivasha Road; Nairobi - Kenya	
<b>Contact</b>	Edward okoth - <a href="mailto:e.okoth@cgiar.org">e.okoth@cgiar.org</a>	
<b>Collection</b>	<b>Living Cells</b>	<b>12420</b>
<b>Constraints</b>	<b>Staffing, Funding, Accessibility</b> <ul style="list-style-type: none"> <li>- Staffing has been reduced through layoffs and elimination of positions</li> <li>- Funding is project based and a portion of funding has to be used to cover storage and staff costs</li> <li>- Significant erosion of funding expected</li> <li>- Collection is catalogued; Computerized database not on the web</li> </ul>	

<b><i>ILRI</i></b>	
<b>Contact</b>	Bishop, Richard (ILRI) - <a href="mailto:R.BISHOP@CGIAR.ORG">R.BISHOP@CGIAR.ORG</a> Hanson, Jean (ILRI) - <a href="mailto:J.HANSON@CGIAR.ORG">J.HANSON@CGIAR.ORG</a>
<b>No survey data</b>	
<p>"ILRI has collections of Rhizobia, insect vectors and some microbes that could be considered."</p> <p>The Manager for the BSU that maintains the records of trypanosome and Theileria stabilates that ILRI holds. In addition he is building a biobank of parasite material collected under a Wellcome Trust funded IDEAL project which will include samples of all parasites detected in cohort of young cattle of in Western Kenya.</p>	

## ***IRRI - International Rice Research Institute***

<b><i>IRRI - N2-fixing organisms collection</i></b>		
<b>Address</b>	Los Baños, Laguna, Philippines	
<b>Contact</b>	S. Haefele <a href="mailto:s.haefele@CGIAR.ORG">s.haefele@CGIAR.ORG</a>	
<b>Collection</b>	<b>Bacteria: 680 (L, A)</b>	<b>167 blue-green algae (L, A)</b>
Bio-fertilizer germplasm collection at IRRI. The collection maintains the following number and kind of germplasm entries:  534 entries for Azolla 176 entries for blue green algae 81 entries for aquatic legumes 373 entries of bacteria 907 entries of frieze dried bacteria (lyophilized)		
<b>Constraints</b>	<b>Size, Funding, Facilities, Characterization, Accessibility</b> <ul style="list-style-type: none"> <li>- Moderate reduction of unit's collection</li> <li>- Erosion of funding expected</li> <li>- Space for collection barely adequate</li> <li>- Objects in collection are accessible but they are deteriorating due to inadequate facilities and/or building systems</li> </ul>	

	<ul style="list-style-type: none"> <li>- Lack of added value through characterization</li> <li>- Collection is catalogued; Computerized database not on the web</li> </ul>
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<i>IRRI - Arthropod collection*</i>		
<b>Address</b>	DAPO Box 7777; Metro Manila; Philippines	
<b>Contact</b>	Ms Jo Catindig - <a href="mailto:jcatindig@cgiar.org">jcatindig@cgiar.org</a>	
<b>Collection</b>	<b>Arthropods</b>	<b>Around 90 000</b>
<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>		

\*=no survey, information from email correspondence

<i>IRRI - Plant Pathology Cluster, Philippines</i>				
<b>Address</b>	DAPO Box 7777; Metro Manila; Philippines			
<b>Contact</b>	Casiana M. Vera Cruz - <a href="mailto:C.VERACRUZ@CGIAR.ORG">C.VERACRUZ@CGIAR.ORG</a>			
<b>Collection</b>	<b>Fungi</b>	<b>738</b> (L, A, C)	<b>Bacteria</b>	<b>11961</b> (L, A, C)
<p>The Plant Breeding, Genetics and Biotechnology (PBGB) Division at IRRI maintains rice bacterial and fungal pathogens that are use for understanding their diversity, and identify also selected isolates/tester strains with particular traits for the breeding program. They also maintain cultures of bacterial community from seeds. They maintain a database of these rice pathogens and bacterial isolates from seeds, many of them are non-pathogenic, while others are also pathogenic to rice. Some of their collections have been distributed to rice researchers through an MTA.</p>				
<b>Constraints</b>	<b>Size, Accessibility</b> <ul style="list-style-type: none"> <li>- Rapid reduction of unit's collection</li> <li>- In need of training for basic collection activities</li> <li>- Space allocation is barely adequate.</li> <li>- Collection is catalogued; Computerized database not on the web</li> </ul>			

## ***Africa Rice Centre (WARDA)***

<i>Africa Rice Centre (WARDA) - Entomology unit</i>		
<b>Address</b>	AfricaRice, 01 BP 2031 Cotonou (BENIN)	
<b>Contact</b>	Francis Nwilene - <a href="mailto:f.nwilene@cgiar.org">f.nwilene@cgiar.org</a>	
<b>Collection</b>	<b>Insects</b>	<b>31 boxes</b> (non-living, available)
<b>Constraints</b>	<b>Staffing, Funding, Facilities, Accessibility</b> <ul style="list-style-type: none"> <li>- Current staff cannot handle routine activities and maintenance of the collections</li> <li>- Staffing has been reduced through layoffs and elimination of positions</li> <li>- Collection expect significant funding cuts</li> <li>- Current space allocation is barely adequate. In need for additional space and/or renovations to increase capacity</li> <li>- Lack of characterization and documentation</li> <li>- Majority is computerized database, not on the Web</li> </ul>	

	- Unit has no written policy regarding IPR (e.g., MTA) for non commercial uses
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<i>Africa Rice Centre (WARDA) - Plant Pathology</i>				
<b>Address</b>	AfricaRice, 01 BP 2031 Cotonou (BENIN)			
<b>Contact</b>	Yacouba Sere - Y.SERE@CGIAR.ORG			
<b>Collection</b>	<b>Fungi</b>	<b>300</b> (L, A, C)	<b>Bacteria</b>	<b>350</b> (L, A, C)
	<b>Viruses</b>	<b>400</b> (living, catalogued)		
<b>Constraints</b>	<p><b>Accessibility, Preservation</b></p> <ul style="list-style-type: none"> <li>- Staffing has been reduced through layoffs and elimination of positions</li> <li>- Special project based funding</li> <li>- The objects in these collection areas are accessible but they are deteriorating due to inadequate facilities and/or building systems</li> <li>- Preservation methods unsuitable for safe long term storage (no cryopreservation or lyophilization). However, collection is partially backed-up elsewhere.</li> <li>- Computerized database, not on the Web</li> <li>- No written policy regarding IPR (e.g., MTA) for non commercial uses</li> </ul>			

**\*survey received in Jan. 2010 - not included in the survey analysis**

## Non-CG

<i>AVRDC - The World Vegetable Center</i>				
<b>Address</b>	60, Yi-Min Liao, Shanhua, Tainan, Taiwan, ROC			
<b>Contact</b>	TIEN-CHEN WANG - <a href="mailto:tien-chen.wang@worldveg.org">tien-chen.wang@worldveg.org</a>			
<b>Collection</b>	<b>Insects</b>	10 (L, A)	<b>Fungi</b>	2200 (L, C)
	<b>Bacteria</b>	2500 (L, C)	<b>Viruses</b>	18 (L, C)
<b>Constraints</b>	<b>Preservation, Accessibility</b> <ul style="list-style-type: none"> <li>- Special project based funding</li> <li>- Current space allocation is barely adequate</li> <li>- Collections have been cataloged but their labeling and preservation materials are unacceptable (but collection partially backed-up elsewhere)</li> <li>- Collection is catalogued, database computerized, but not web accessible</li> </ul>			

<i>ICIFE - African insect science for food and health - Biosystematic Support Unit</i>	
<b>Address:</b>	ICIFE - Kenya - Nairobi
<b>Contact</b>	Fabian Haas - <a href="mailto:fhaas@icipe.org">fhaas@icipe.org</a>
<b>Collection</b>	<b>Insects</b> ~30.000 (non-living, available)
<p>We have a dry insect collection small size 20.000 specimens if at all mainly economically important species of Diptera: Tephritidae some Diptera: Glossina stem borer parasitoids, mainly Ichneumonidae and Braconidae some butterflies and mites (Acari) of another research project and a variety of Heteroptera, Coleoptera and Orthoptera found in a number of cultures.</p>	
<b>Constraints</b>	<b>Accessibility</b> <ul style="list-style-type: none"> <li>- In need of training for basic collection activities</li> <li>- Collection is catalogued, database computerized, but not web accessible</li> </ul>

<i>ICIFE - African insect science for food and health - Thrips IPM Program</i>	
<b>Address:</b>	ICIFE - Kenya - Nairobi
<b>Contact</b>	Subramanian Sevgan - <a href="mailto:ssubramania@icipe.org">ssubramania@icipe.org</a>
<b>Collection</b>	<b>Insects</b> 2100 Thrips (non-living, catalogued)
<b>Constraints</b>	<b>Preservation, Accessibility</b> <ul style="list-style-type: none"> <li>- Special project based funding</li> <li>- Partially: collections have been cataloged but their labeling and preservation materials are unacceptable; lack important specimen data</li> <li>- Collection is catalogued, database computerized, but not web accessible</li> </ul>

### \*1) Details of ICARDA non-plant taxa collections:

Taken from a presentation by Ahmed Amri (ICARDA)

### 1,468 Rhizobia strains conserved at ICARDA (lyophilized)

Taxon	Strains	Origin
Rhizobium ciceri	99	18 countries ( 49-WANA, 10-America, 20-Asia, 13-Europe, 7-Unknown)
Rhizobium meliloti	685	9 countries (677 WANA 6 A t li 2 677-WANA, 6-Australia, 2-Unknown)
Rhizobium trifolii	244	4 countries (243-WANA, 1-Unknown)
Rhizobium leguminosarum	440	18 countries (387 WANA 8 Africa 28 America 387-WANA, 8-Africa, 28-America, 7-Asia, 4-Europe, 1-Australia, 5- Unknown)

### Isolates of major diseases of wheat and barley maintained by ICARDA

Taxon	Strains	Origin
Puccinia graminis f. sp. Tritici	184	Yemen (29), Lebanon (4)
Pu. recondita f. sp. tritici	86	Lebanon (6)
Pu. striiformis f. sp. Tritici	119	Lebanon (1)
Mycosphaerella	5	Syria
Pyrenophora teres	117	Ethiopia (14), Eritrea (20), Lebanon (15), Kazakhstan (10)
Rhynchosporium secalis	198	Tunisia (50), Eritrea (40), Lebanon (20), Ethiopia (30)
Pyrenophora gramineum	83	-

### Isolates of major diseases of food legumes maintained at ICARDA

Pathogen	Number of isolates	Host
Ascochyta rabiei	6 races	Chickpea
Ascochyta lentis	1 isolate	Lentil
Ascochyta fabae	13 isolates	Faba bean
Botrytis fabae	16 isolates	Faba bean
Fusarium oxysporum f.sp. ciceris	10 isolates	Chickpea
Clonostachy sp.	4 isolates	Chickpea
Sclerotinia sclerotiorum	1 isolate	Chickpea
Fusarium oxysporum f. sp. lentis	1 population	Lentil
Heterodera ciceris	1 population	
Orobanche spp	2 populations	
Rhizoctonia bataticola	5 isolates	Chickpea

### Isolates of major viruses of food legumes (maintained at after 1993) ICARDA

Virus name	Number of isolates (Source)
Bean yellow mosaic	6 (Syria, Egypt, Sudan, Tunisia, Morocco, Lebanon)
Bean leafroll	7 ( Syria, Tunisia, Turkey, Iran, Ethiopia, Australia, Azerbaijan)
Faba bean necrotic yellows	5 (Syria, Tunisia, Egypt, Ethiopia, Azerbaijan)
Beet western yellows	5 (Syria, Tunisia, Eritrea, Ethiopia, Azerbaijan)
Broad bean stain	1 (Syria)
Soybean dwarf	3 (Syria, Ethiopia, Tunisia)
Chickpea chlorotic stunt	Syria, Tunisia, Azerbaijan
Chickpea chlorotic dwarf	3 (Syria, Sudan, Iran)
Broad bean mottle	3 (Syria, Tunisia, Morocco)
Broad bean true mosaic	2 (Syria, Germany)
Cucumber mosaic	1 (Syria)

### Syrian strains of different organisms maintained by Seed Health Laboratory

<b>Taxon</b>	<b>Strains</b>
Bacteria	Xanthomonas campestris pv. undulosa Pseudomonas syringae pv. pisi
Fungi	Tilletia caries & T. foetida Urocystis agropyri Pyrenophora graminea Ascochyta rabiei Ascochyta fabae Ascochyta lentis
Parasitic weeds	Orobanche spp. Cuscuta spp
Nematodes	Anguina tritici

### Entomopathogenic fungi isolates available at ICARDA's Biopesticide Laboratory (after 1993)

<b>Fungi name</b>	<b>Total isolates</b>	<b>Number of isolates (Source)</b>
Beauveria bassiana	98	18 (Iran), 3 (Kyrgyz Republic), 8 (Kazakhstan), 12 (Turkey), 10 (Russia), 26 (Syria), 19 (Uzbekistan)
Beauveria sp.	4	4 (Turkey)
Fusarium sp.	2	1 (Kyrgyz Republic ), 1 (Kazakhstan)
Paecilomyces farinosus	11	5 (Iran) 1 (Kazakhstan), 4 (Russia), 1 (Turkey)
Paecilomyces lilacinus	6	2 (Kazakhstan), 3 (Russia),1 (Uzbekistan)
Paecilomyces sp.	2	1 (Iran), 1 (Kazakhstan)
Verticillium lecanii	4	1 (Iran), 1 (Russia), 2 (Syria)
Verticillium lamellicola	1	(Turkey)

## Inventory list – International repositories

The information presented in this inventory list has been collected through the GPG2 non-plant taxa survey. Additional information have been obtained from the World Data Centre for Microorganism (WDCM) (<http://wdcn.nig.ac.jp/hpcc.html>) and through web-search. Descriptive text was obtained either through email correspondence or from the unit's/institutes websites. Text can be partially modified.

The following inventory lists 28 international repositories (non-CGIAR collections). Of which 26 completed the GPG2 non-plant taxa survey. These 26 collections hold the following number of specimen:

Taxa	Number of specimen	% living specimens	Number of Collections holding these specimens
Insects	~4 Million	<0.04	5
Fungi	~2 Million	>3	17
Bacteria	156.534	>85	15
Viruses	2.470	>22	5
Nematodes	~573.838	<0.01	5
Living Cells	906	100	4
Others	516.752	>0.3	5

24 of the 28 collections listed store Microorganisms of which 20 are registered at the WDCM (>80%)

The following pro forma is used to present the data for each collection. The collections are listed according to the number of specimen (descending).

### Collection - Acronym / Name

<b>Address:</b>	---		
<b>Contact</b>	<i>Name</i>	<i>email</i>	
<b>Links</b>	<i>Links to website/databases etc.</i>		
<b>Collection</b>	<b>Taxon</b> (e.g. Fungi)	<b>Number of specimens</b> (living, non living, catalogued, availability)	
<b>WDCM number</b>	<i>For collections registered in the WDCM</i>	<b>ISO Standard</b>	<i>Quality standards implemented (e.g. ISO standards)</i>

Additional information (e.g. obtained form website)

## *BPI: U.S. National Fungus Collections - USDA Agricultural Research Service - Systematic Mycology & Microbiology Laboratory*

<b>Address:</b>	Rm. 304, Bldg. 011A, BARC-West; 10300 Baltimore Ave.; Beltsville, MD 20705; Tel: (301) 504-5364		
<b>Contact</b>	Amy Rossman (Director) <a href="mailto:Amy.Rossman@ars.usda.gov">Amy.Rossman@ars.usda.gov</a>		
<b>Links</b>	U.S. Dept. of Agriculture: <a href="http://www.usda.gov/">http://www.usda.gov/</a> BPI: <a href="http://www.ars.usda.gov/Services/docs.htm?docid=9397">http://www.ars.usda.gov/Services/docs.htm?docid=9397</a> Database: <a href="http://nt.ars-grin.gov/fungalatabases/index.cfm">http://nt.ars-grin.gov/fungalatabases/index.cfm</a>		
<b>Collection</b>	<b>Fungi</b>	<b>950000</b>	(non-living species catalogued)
		<b>5000</b>	(Living specimens available and catalogued)
<b>WDCM number</b>	---	<b>Q Standard</b>	?

The Agricultural Research Service (ARS) is the U.S. Department of Agriculture's chief scientific research agency. Researchers at the Systematic Mycology and Microbiology Laboratory study the systematics of fungi important as biological control agents and plant pathogens. The U.S. National Fungus Collections holds about 1.000.000 collections; 65.000 taxa, including species and varieties. Specimen data for most groups of fungi have been computerized.

## *Royal Botanic Gardens Kew*

<b>Address:</b>	Royal Botanic Gardens, Kew; Richmond; Surrey; TW9 3AB; UK Tel.: +44 (0)20 8332 5000		
<b>Contact</b>	Dr. Begoña Aguirre-Hudson (Mycology) - <a href="mailto:B.aguirre-hudson@kew.org">B.aguirre-hudson@kew.org</a> Dr Brian Spooner (curator and current head of the section) - <a href="mailto:b.spooner@kew.org">b.spooner@kew.org</a>		
<b>Links</b>	Main page: <a href="http://www.kew.org/">http://www.kew.org/</a> <a href="http://www.kew.org/plants-fungi/index.htm">http://www.kew.org/plants-fungi/index.htm</a>		
<b>Collection</b>	<b>Fungi</b>	<b>800000</b>	(non-living species available and catalogued)
	<b>Myxomycetes &amp; Oomycetes</b>	<b>15000</b>	(non-living species available and catalogued)
<b>WDCM number</b>	---	<b>Q Standards</b>	ISO 14001

The Royal Botanic Gardens Kew is one of the key international centres for the study of fungal diversity and with over 800000 fungal collections it holds one of the most comprehensive global reference collections to be found anywhere, together with the facilities, the expertise, and above all a long-standing reputation as a world authority on systematic mycology

CABI recently entrusted one of the world's largest reference collections of preserved fungi containing 400,000 specimens to Kew.

In 2005 The Royal Botanic Gardens, Kew, has been awarded certification to the prestigious international standard for Environmental Management Systems (ISO 14001). The standard is a stringent set of measures primarily concerned with environmental management.

## *U.S. National Parasite Collection – Dept. Agriculture - ARS*

<b>Address:</b>	BARC East 1180, 10300 Baltimore Avenue; Beltsville; Maryland; 20705		
<b>Contact</b>	Dr. Eric P. Hoberg (Curator) <a href="mailto:Eric.Hoberg@ARS.USDA.GOV">Eric.Hoberg@ARS.USDA.GOV</a>		
<b>Links</b>	Main page: <a href="http://www.ars.usda.gov/Main/docs.htm?docid=12004">http://www.ars.usda.gov/Main/docs.htm?docid=12004</a> Database: <a href="http://www.ars.usda.gov/Main/docs.htm?docid=12004&amp;page=10">http://www.ars.usda.gov/Main/docs.htm?docid=12004&amp;page=10</a>		
<b>Collection</b>	<b>Insects</b>	<b>8000 lots</b>	a lot is anywhere from 1 to several thousand specimens
	<b>Nematodes</b>	<b>50000 lots</b>	a lot is anywhere from 1 to several

		thousand specimens
	<b>Platyhelminthes, Acanthocephala, Apicomplexa</b>	<b>50000 lots</b> a lot is anywhere from 1 to several thousand specimens
<b>WDCM</b>	N/A	<b>Q Standards</b> ???

At the Agricultural Research Service of the US Department of Agriculture (USDA) research on parasites and pathogens that directly or indirectly threaten animal health, food safety and the environment is carried out. The current collection is among the largest in the world (100,000 lots, and over 20 million individual specimens; 3,000 holotypes, 7,000 type series) and accumulates about 1,000-1500 new lots of specimens annually.

A primary role of the USNPC is acquisition, curation, and long-term maintenance of the specimens-based collections; and development and expansion of the collections database as an irreplaceable national archive. The specimen collection is linked to extensive documentation for host occurrence, geographic range, and other core data with which to assess the current and historical distribution of parasites and pathogens with a database accessed via the internet.

### *CABI - Centre for Agriculture and Biosciences International\**

<b>Address:</b>	CABI Head Office; Nosworthy Way; Wallingford; Oxfordshire; OX10 8DE UK; Tel: (+44) 01491 832111	
<b>Contact</b>	David Smith - (Director Biological Resources) <i>d.smith@cabi.org</i>	
<b>Links</b>	Main page:	<a href="http://www.cabi.org/">http://www.cabi.org/</a>
	Microbial service:	<a href="http://www.cabi.org/default.aspx?site=170&amp;page=1010">http://www.cabi.org/default.aspx?site=170&amp;page=1010</a>
<b>Collection</b>	<b>Fungi</b>	<b>26000</b> (living species available) <b>14000</b> (living species catalogued) <b>38000</b> (non-living species available and catalogued)
	<b>Bacteria</b>	<b>2000</b> (non-living species available and catalogued)
<b>WDCM</b>	<a href="#">WDCM214</a>	<b>Q Standards</b> ISO 17025

CABI manages the UK's National Collection of Fungus Cultures of 28,000 living strains since 1947. They recently entrusted one of the world's largest reference collections of preserved fungi containing 400,000 specimens to Kew. The collection is a member of the United Kingdom National Culture Collection (UKNCC), a UNESCO Microbial Resource Centre (MIRCEN) and an International Depository Authority (IDA) within the Budapest Treaty (1977). The service range from identification, supply and preservation of microorganisms, UKAS accredited microbial testing and consultancy, safe and patent deposit, training on identifying and preserving microorganisms.

#### **\*Incomplete survey**

### *Cirad - Umr CBGP\**

<b>Address:</b>	UMR BGPI; CIRAD TA A-54/K ; Campus International de Baillarguet; 34398 MONTPELLIER CEDEX 5 - FRANCE	
<b>Contact</b>	Henri-Pierre Aberlenc - (Entomologist) <i>henri-pierre.aberlenc@cirad.fr</i>	
<b>Links</b>	CBGP – Cirad	<a href="http://www.ensam.inra.fr/cbcp/?q=en">http://www.ensam.inra.fr/cbcp/?q=en</a>
	Projects, tools and technologies:	<a href="http://www.cirad.fr/en/research-operations/collective-research-tools">http://www.cirad.fr/en/research-operations/collective-research-tools</a>
<b>Collection</b>	<b>Insects</b>	<b>300000</b> (non-living species available and catalogued)
<b>WDCM</b>	N/A	<b>Q-Standards</b> ???

CIRAD is a French research centre that works with developing countries to tackle international agricultural and development issues.

The CBGP (a joint research unit INRA/IRD/CIRAD/AGRO.M) carries out research in the fields of systematics, genetics and ecology relevant to the management of populations and communities of organisms for the purposes of agriculture, public health and biodiversity. The CBGP has a resource of expertise in systematics, and maintains reference collections and databases for entomology, acarology, nematology and mammalogy. The latest molecular tools are used increase the efficiency and accuracy

of taxonomic identification. The CBGP has developed numerous collaborations with tropical taxonomists based on this resource.

### Swedish university of agricultural sciences, Department of ecology

<b>Address:</b>	Arrheniusplan 12, Ultuna, Uppsala POSTADDRESS: P.O. Box 7082, 750 07 UPPSALA • Phone +46-(0)18-671000 • Fax +46-(0)18-671700
<b>Contact</b>	Ake Lindelow - (Senior entomologist) <a href="mailto:ake.lindelow@ekol.slu.se">ake.lindelow@ekol.slu.se</a>
<b>Links</b>	Dept. of Ecology: <a href="http://www.ekol.slu.se/">http://www.ekol.slu.se/</a>
<b>Collection</b>	<b>Insects</b> <b>300000</b> (non-living species available and catalogued)
<b>WDCM</b>	N/A <b>Q Management</b> ???

Within the ecology department we conduct both empirical and theoretical research that can provide knowledge for efficient conservation, efficacious plant protection as well as sustainable forest and crop production. We study the influence of climate change on soil, plants, and animals. Solutions are sought that will preserve threatened species, benefit biological diversity, and control pests. These divergent goals require a broad understanding of ecological interactions in nature. Populations, communities, and ecosystems are central concepts.

### Plant Pathology Herbarium - New South Wales Department of Primary Industries

<b>Address:</b>	Orange Agricultural Institute; 1447 Forest Road; Orange NSW 2800, Australia
<b>Contact</b>	Michael Priest - (Special Plant Pathologist) <a href="mailto:michael.priest@dpi.nsw.gov.au">michael.priest@dpi.nsw.gov.au</a>
<b>Links</b>	Link to the Agricultural Scientific Collections Unit: <a href="http://www.dpi.nsw.gov.au/research/areas/research-operations/scientific-collections-unit">http://www.dpi.nsw.gov.au/research/areas/research-operations/scientific-collections-unit</a> Link to the Plant pathology Herbarium: <a href="http://www.dpi.nsw.gov.au/aboutus/services/collections/herbarium">http://www.dpi.nsw.gov.au/aboutus/services/collections/herbarium</a>
<b>Collection</b>	<b>Fungi</b> <b>4000</b> (living species available and catalogued) <b>120000</b> (non-living species available) <b>90000</b> (non-living species catalogued) <b>Bacteria</b> <b>2000</b> (living species available and catalogued) <b>2900</b> (non-living species available and catalogued) <b>Viruses</b> <b>70</b> (living species available and catalogued) <b>1900</b> (non-living species available and catalogued) <b>Nematodes</b> <b>1900</b> (non-living species available and catalogued)
<b>WDCM</b>	<a href="#">WDCM365</a> <b>Q Standards</b> ISO 9001:2000

The NSW Department of Primary Industries is the largest provider of science and research services within the NSW Government. Significant national resources are housed in scientific collections across NSW. They contain physical specimens and historical records relating to plant genotypes, soils, rocks, minerals, fossils, forestry woods, fish, insects, mites, fungi and bacteria. They include living cultures of fungi and bacteria and are of immense quarantine and diagnostic significance.

### CCUG - Culture Collection, University of Goteborg, Department of Clinical Bacteriology, Sahlgrenska University Hospital

<b>Address:</b>	Guldhedsg 10, Goteborg S-413 46; Sweden; Tel.: (46) 31-3424696
<b>Contact</b>	Prof. Dr. Edward R.B. Moore – (Curator; Head of the CCUG) <a href="mailto:Erbmoore@ccug.se">Erbmoore@ccug.se</a>
<b>Links</b>	Main page: <a href="http://www.ccug.se/">http://www.ccug.se/</a> Database: <a href="http://www.ccug.se/default.cfm?navID=147">http://www.ccug.se/default.cfm?navID=147</a>

<b>Collection</b>	<b>Fungi</b>	<b>500</b>	(living species available)
		<b>600</b>	(living species catalogued)
		<b>100</b>	(non-living species catalogued)
	<b>Bacteria</b>	<b>40000</b>	(living species available)
		<b>58000</b>	(living species catalogued)
		<b>18000</b>	(non-living species catalogued)
<b>WDCM</b>	<a href="#">WDCM32</a>	<b>Q Standards</b>	SWEDAC, EQUALIS, UKNE QAS

The CCUG holds a broad range of bacteria and the most demanded test strains of filamentous fungi and yeasts. Cultures are freeze-dried and may be sent abroad promptly under controlled forms. Our identification service has been active for 41 years. The website contains a database with search engine and extensive information on i.a.; deposit, strain selection, order of strains, revival and growth, preservation (with recommendations of quality control procedures), identification, QC schemes and taxonomy

### *ARC - Plant Protection Research Institute; Agricultural Research Council of S.A*

<b>Address:</b>	Agricultural Research Council; 1134 Park street, Hatfield, Pretoria		
<b>Contact</b>	Dr. Gerhard Prinsloo - <a href="mailto:prinsloog@arc.agric.za">prinsloog@arc.agric.za</a>		
<b>Links</b>	ARC main page: <a href="http://www.arc.agric.za/">http://www.arc.agric.za/</a> Plant Protection Research Institute: <a href="http://www.arc.agric.za/home.asp?pid=376">http://www.arc.agric.za/home.asp?pid=376</a>		
<b>Collection</b>	<b>Insects</b>	<b>Several millions</b>	(non-living species available)
		<b>Several thousands</b>	(non-living species catalogued)
	<b>Fungi</b>	<b>600</b>	(living species available and catalogued)
		<b>53000</b>	herbarium samples (non living available)
		<b>15000</b>	(non-living species catalogued)
	<b>Nematodes</b>	<b>20000</b>	(non-living species available)
<b>15000 slides</b>		(non-living species catalogued)	
<b>WDCM</b>	<a href="#">WDCM351</a>	<b>Q Standards</b>	???

The Biosystematics division of the Agricultural Research Council conducts systematic and ecological research on economically and environmentally important groups of arthropods, nematodes and fungi. They are also the custodians of the South African National Collections of Arachnida, Fungi, Insects and Nematodes, which form an invaluable basis for taxonomic research and services and an archive of the country's biological diversity. They provide comprehensive biosystematic advisory services and products to the research community concerned with agricultural and natural resource management in southern Africa and further afield.

Link to the National Collection of:

- Arachnida (NCA): <http://www.arc.agric.za/home.asp?pid=4243>
- Insects: <http://www.arc.agric.za/home.asp?pid=938>
- Fungi: <http://www.arc.agric.za/home.asp?pid=929>
- Nematodes (NCN): <http://www.arc.agric.za/home.asp?pid=941>

### *Nematology Laboratory, US Department of Agriculture*

<b>Address:</b>	Nematology Laboratory; United States Department of Agriculture Henry A. Wallace Beltsville Agricultural Research Center; Plant Sciences Institute BARC-West, Bldg. 011A, Rm. 165A; Beltsville, MD 20705-2350 PHONE 301-504-5660
<b>Contact</b>	David Chitwood - (Research Leader) <a href="mailto:david.chitwood@ars.usda.gov">david.chitwood@ars.usda.gov</a>
<b>Link</b>	USDA Nematode Collection Search: <a href="http://nt.ars-grin.gov/nematodes/search.cfm">http://nt.ars-grin.gov/nematodes/search.cfm</a>

<b>Collection</b>	<b>Nematodes</b>	<b>10</b> (living species available) <b>50000</b> (non-living species available) <b>40000</b> (non-living species catalogued)
<b>WDCM</b>	N/A	<b>Q Standards</b> in-house SOPs

The mission of the Nematology Laboratory is to develop environmentally safe control strategies for plant-parasitic nematodes, thereby promoting agricultural sustainability, assuring food safety, improving water quality, and providing linkage to integrated pest management systems.

## BIOTEC - National Center for Genetic Engineering and Biotechnology

<b>Address:</b>	Bioresources Technology Unit; National Center for Genetic Engineering and Biotechnology (BIOTEC) 113 Thailand Science Park; Paholyothin Road, Klong 1, Klong Luang; Pathumthani 12120, Thailand ; Tel: (66-2) 5646700	
<b>Contact</b>	Suwanee Chunhametha - <a href="mailto:suwanee@biotec.or.th">suwanee@biotec.or.th</a> Dr. Lily Eurwilaichitr – (Director) <a href="mailto:lily@biotec.or.th">lily@biotec.or.th</a>	
<b>Links</b>	Main page: <a href="http://bcc.biotec.or.th/">http://bcc.biotec.or.th/</a>	
<b>Collection</b>	<b>Fungi</b>	<b>26774</b> (living species available) <b>2553</b> (living species catalogued)
	<b>Bacteria</b>	<b>7068</b> (living species available) <b>483</b> (living species catalogued)
<b>WDCM</b>	<a href="#">WDCM783</a>	<b>Q Standards</b> ISO 9001 (since 2005)

The main purposes of the BIOTEC Culture Collection (BCC) are to collect and preserve microbial culture isolated in Thailand, to supports the National Biodiversity Policy in conservation and sustainable uses of microbial resources in accordance to the Biodiversity Convention.

The Bioresources Technology Unit was established in 2007, spun off from BIOTEC Central Research Unit. The Unit aims to discover the potential valuable products, whether in the form of compounds, enzymes or genes, from microorganisms, through highly systematic and efficient research.

Activities of the BIOTEC Culture Collection include: Culture preservation; Microbial cultures; Lyophilization and preparation of cultures for storage by freezing in which cultures are expertly preserved and prepared before returning to customers for storage; Purification and identification of fungi, yeasts, and bacteria; Training on preservation techniques, culture collection management and identification of fungi, yeasts and bacteria

## BCCM/LMG Bacteria Collection - Gent University

<b>Address:</b>	BCCM/LMG; Laboratorium voor Microbiologie, Universiteit Gent (UGent) K.L. Ledeganckstraat 35; B-9000 Gent Phone: +32-(0)9-264.51.08	
<b>Contact</b>	Claudine Vereecke – (Public Collection Curator) <a href="mailto:Claudine.Vereecke@ugent.be">Claudine.Vereecke@ugent.be</a>	
<b>Links</b>	BCCM <a href="http://bccm.belspo.be/index.php">http://bccm.belspo.be/index.php</a> LMG <a href="http://bccm.belspo.be/about/lmg.php">http://bccm.belspo.be/about/lmg.php</a> BCCM/LMG catalogue: <a href="http://bccm.belspo.be/db/lmg_search_form.php">http://bccm.belspo.be/db/lmg_search_form.php</a>	
<b>Collection</b>	<b>Bacteria</b>	<b>22500</b> (living species available) <b>14000</b> (living species catalogued) <b>2000</b> (non-living species available)
<b>WDCM</b>	<a href="#">WDCM296</a>	<b>Q Standards</b> ISO 9001/2008; BRC Guidelines

The BCCM/LMG is one four complementary research-based service culture collections:of the Belgian Co-ordinated Collections of Micro-organisms (BCCM). The BCCM collections are coordinated by a central team at the Belgian Federal Science Policy.

The BCCM/LMG public collection maintains over 22.000 bacterial strains, representing some 380

genera and 2.700 species, subspecies or pathovars. Website with catalogues for fungi, bacteria and yeasts with search function and additional information

### *DSMZ: German Collection of Microorganisms and Cell Cultures*

<b>Address:</b>	DSMZ - Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH Inhoffenstraße 7 B; 38124 Braunschweig; GERMANY		
<b>Contacts</b>	Hans-Peter Klenk – (Head of Department – Microbiology) <a href="mailto:hpk@dsmz.de">hpk@dsmz.de</a> Dagmar Fritze – (Coordination External Affairs and Bodies) <a href="mailto:dfr@dsmz.de">dfr@dsmz.de</a>		
<b>Links</b>	Main page: <a href="http://www.dsmz.de/">http://www.dsmz.de/</a> MO Catalogue: <a href="http://www.dsmz.de/microorganisms/main.php?contentleft_id=6">http://www.dsmz.de/microorganisms/main.php?contentleft_id=6</a>		
<b>Collection</b>	<b>Fungi</b>	<b>3000</b>	(living species available and catalogued)
	<b>Bacteria</b>	<b>15000</b>	(living species available and catalogued)
	<b>Viruses</b>	<b>200</b>	(living species available and catalogued)
	<b>Living cells</b>	<b>630</b>	(living species available and catalogued)
<b>WDCM</b>	<a href="#">WDCM274</a>	<b>Q Standards</b>	ISO 9001-2000

The DSMZ - Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH (German Collection of Microorganisms and Cell Cultures) is an independent, non-profit organisation and the most comprehensive Biological Resource Centre in Europe. It holds more than 18.000 microorganisms, 1.200 plant viruses, 600 human and animal cell lines, 770 plant cell cultures and more than 7.100 cultures deposited for the purposes of patenting, Since 2004, the DSMZ is certified by DIN EN ISO 9001-2000. The DSMZ is a member of: WFCC, ECCO, CABRI.

Available: database with search function, information portal and advisory centre for the scientific community, offer teaching and service facilities., Collections: Services: Identification and Characterization, Deposit of Biological Material, Bacterial Nomenclature up-to-date.

### *FCUG: Fungal Cultures University of Goteborg, Botanical Institute*

<b>Address:</b>	Department of Plant and Environmental Sciences Göteborg University; Box 461; SE-405 30 Göteborg, Sweden Tel: +46 - 31 7862659		
<b>Contact</b>	Prof. Nils Hallenberg - <a href="mailto:nils.hallenberg@dpes.gu.se">nils.hallenberg@dpes.gu.se</a>		
<b>Link</b>	Database: <a href="http://www2.dpes.gu.se/FCUGsrch.html">http://www2.dpes.gu.se/FCUGsrch.html</a>		
<b>Collection</b>	<b>Fungi</b>	<b>9000</b>	(living species available and catalogued)
		<b>2000</b>	(non-living species catalogued)
<b>WDCM</b>	<a href="#">WDCM651</a>	<b>Q Standards</b>	?

The FCUG collection at the University of Göteborg, Sweden, is particularly rich in cultures of wood-rotting basidiomycetes. The culture collection is registered at the World Data Center on Microorganisms and is a member of ECCO. Website: a searchable interface is provided. Cultures and sequence data are available. Information on Isolation and storage.

### *ARSEF: USDA-ARS Biological Integrated Pest Management Research Unit - Collection of Entomopathogenic Fungal Cultures*

<b>Address:</b>	Tower Road, Ithaca, New York, 14853-2901; U.S.A. Tel.: (1) 607-255-1276		
<b>Contact</b>	Dr. Richard A. Humber - <a href="mailto:richard.humber@ars.usda.gov">richard.humber@ars.usda.gov</a>		
<b>Link</b>	Web: <a href="http://arsef.fpsnl.cornell.edu/mycology/ARSEF_Culture_Collection.html">http://arsef.fpsnl.cornell.edu/mycology/ARSEF_Culture_Collection.html</a> Catalogue: <a href="http://arsef.fpsnl.cornell.edu/mycology/catalogs/Catalog.pdf">http://arsef.fpsnl.cornell.edu/mycology/catalogs/Catalog.pdf</a>		
<b>Collection</b>	<b>Fungi</b>	<b>9000</b>	(living species available and catalogued)

**WDCM** [WDCM112](#) **500** (non-living species available)  
**Q Standards** ?

The ARS Collection of Entomopathogenic Fungal Cultures (ARSEF) provides fundamental support for basic and applied research on the fungal pathogens of invertebrates. Emphasis is on acquiring and distributing strains under active study for use as potential biological control agents.

Identification services for specimens and cultures historically free of charge to any laboratories requesting them. Website provides current catalogue and is a good source of information.

### *NCIMB: National Collections of Industrial Food and Marine Bacteria*

**Address:** NCIMB Ltd; Ferguson Building; Craibstone Estate; Bucksburn; Aberdeen; Great Britain AB21 9YA; Tel: +44 (0) 1224 711100

**Contact** Peter Green - (Director and Curator) [p.green@ncimb.com](mailto:p.green@ncimb.com)

**Link** Main page: <http://www.ncimb.com/>  
 Catalogue: <http://www.ncimb.com/search.php?parent=culture>

**Collection** **Bacteria** **7500** (living species available)  
**Others** **1000** (living species available)

**WDCM** [WDCM653](#) **Q Standards** ISO 9001:2000 and IIP status

NCIMB is a professional microbiology company and the largest industrial, marine and food culture collection in the UK. Services range from culture maintenance and preservation through microbiological and chemical identification and analysis, to the support of novel discovery research. Collection is ISO 9001:2000 certified and has IIP status. NCIMB is a member of CABRI (Common Access to Biological Resources and Information).

Comprehensible website with catalogue and information on Microbial preservation; Policies and Material transfer agreement; Ordering And Pricing; Safe Deposit Service; Patent Deposits

### *NBIMCC: National Bank for Industrial Microorganisms and Cell Cultures*

**Address:** 125 "Tzarigradsko shaussee" blvd., bl. 2, et. 5, Sofia, Bulgaria Telephone (+359 2) 8 72 08 65

**Contact** Dr. Todor Nikolov Donev - [info@nbimcc.org](mailto:info@nbimcc.org)

**Links** Main page: <http://www.nbimcc.org/>  
 Catalogue: [http://www.nbimcc.org/cat/nbimcc\\_catalogue.html](http://www.nbimcc.org/cat/nbimcc_catalogue.html)

**Collection** **Fungi** **1100** (living species available)  
**560** (living species catalogued)  
**Bacteria** **6300** (living species available)  
**1170** (living species catalogued)  
**Viruses** **260** (living species available)  
**163** (living species catalogued)  
**Living Cells** **120** (living species available)  
**54** (living species catalogued)

**WDCM** [WDCM135](#) **Q Standards** ?

NBIMCC is a State-property scientific organisation, successor of the Bulgarian Type Culture Collection (BTCC) and an international depositary authority of microbiological objects.

NBIMCC maintains over 8000 strains including bacteria, actinomycetes, yeasts, fungi, plasmid-bearing microorganisms, animal and plant viruses, and animal cell cultures. They belong to more than 550 species from 204 genera and most of them could be found only in NBIMCC. The preserved strains are useful for and are applied in education, research investigations, health services, industry and agriculture. NBIMCC is member of WFCC, ECCO and partner in the international project for developing a European Biological Resource Centres Network (EBRCN).

## *VTCC: Vietnam Type Culture Collection (VTCC), Institute of Microbiology and Biotechnology (IMBT), Vietnam National University*

<b>Address:</b>	Vietnam National University, Institute of Microbiology and Biotechnology - Vietnam Type Culture Collection; E2 Building, No.144, Xuan Thuy Road, Cau Giay District, Hanoi, Vietnam; Tel: 84-4-7547695		
<b>Contacts</b>	Dr. Duong Van Hop - (Head of VTCC) <a href="mailto:vanhop93@yahoo.com">vanhop93@yahoo.com</a>		
<b>Links</b>	Main page: <a href="http://www.biotechvnu.edu.vn/vtcc">http://www.biotechvnu.edu.vn/vtcc</a> Catalogue: <a href="http://www.biotechvnu.edu.vn/vtcc/index.php?option=com_content&amp;task=view&amp;id=20&amp;Itemid=37">http://www.biotechvnu.edu.vn/vtcc/index.php?option=com_content&amp;task=view&amp;id=20&amp;Itemid=37</a>		
<b>Collection</b>	<b>Fungi</b>	<b>3300</b>	(living species available)
		<b>800</b>	(living species catalogued)
	<b>Bacteria</b>	<b>3100</b>	(living species available)
		<b>400</b>	(living species catalogued)
	<b>Living Cells</b>	<b>50</b>	(living species available)
		<b>30</b>	(living species catalogued)
<b>WDCM</b>	<a href="#">WDCM933</a>	<b>Q Standards</b>	?

The Vietnam Type Culture Collection (VTCC) is part of the Institute of Microbiology and Biotechnology (IMBT), Vietnam National University Hanoi (VNU). The main objectives of the collection are to: Enrich and maintain useful microorganisms, carry out taxonomical research, study diversity and utilization (bioactive compounds), Provide pure cultures of microorganisms and related information as well as consultation in the field of microbiology; offer training in the fields of microbial diversity and culture collection management.

## *CFBP: Collection Francaise de Bacteries Phytopathogenes, Institut National de la Recherche Agronomique (INRA)*

<b>Address:</b>	CFBP; UMR PaVé - INRA 42, Rue Georges Morel, BP 60057 49071 Beaucouzé Cedex FRANCE tel : +33 2 41 22 57 19 (57 29)		
<b>Contact</b>	Dr. Marion le Saux - (Director) <a href="mailto:cfbp@angers.inra.fr">cfbp@angers.inra.fr</a> Main page: <a href="http://www-intranet.angers.inra.fr/cfbp/index_e.html">http://www-intranet.angers.inra.fr/cfbp/index_e.html</a> Catalogue: <a href="http://www-intranet.angers.inra.fr/cfbp/recherche_e.php">http://www-intranet.angers.inra.fr/cfbp/recherche_e.php</a>		
<b>Collection</b>	<b>Bacteria</b>	<b>5500</b>	(living species available)
<b>WDCM</b>	<a href="#">WDCM639</a>	<b>Q Standards</b>	ISO 9001:2000

The French collection of plant pathogenic bacteria is an international reference for the genetic resources of plant pathogenic bacteria. Its role is to preserve these biological resources and associated information which are deposited there, and to provide them to the international community for research, development, teaching and identification purposes.

Most of the strains are plant pathogenic bacteria. CFBP also includes saprophyte strains or strains closely associated to plants (phytocommensales and rhyzobacteria). CFBP currently comprises 5400 strains, belonging mainly to the genera *Acidovorax*, *Agrobacterium*, *Bacillus*, *Brenneria*, *Burkholderia*, *Clavibacter*, *Curtobacterium*, *Dickeya*, *Enterobacter*, *Erwinia*, *Pantoea*, *Pectobacterium*, *Pseudomonas*, *Ralstonia*, *Rhizobium*, *Rhodococcus*, *Streptomyces*, *Xanthomonas* and *Xylophilus*.

The strains are preserved freeze-dried and the stocks maintained in two separate places. A duplicate of the collection preserved at -80°C is under constitution. The collection is ISO 9001 certified.

## CARDI - Cambodian Agricultural Research and Development Institute - Plant Protection Division

<b>Address:</b>	National Road No 3, Prateah Lang Commune, Dangkor District, Phnom Penh, Kingdom of Cambodia. Tel (855-23) 219 693, (855-23) 219 694		
<b>Contact</b>	Dr. Khay Sathya - (Head Office) <a href="mailto:ksathya@cardi.org.kh">ksathya@cardi.org.kh</a>		
<b>Links</b>	CARDI: <a href="http://www.cardi.org.kh/">http://www.cardi.org.kh/</a> CARDI Plant Protection: <a href="http://www.cardi.org.kh/index.php?option=com_content&amp;view=article&amp;id=60&amp;Itemid=14">http://www.cardi.org.kh/index.php?option=com_content&amp;view=article&amp;id=60&amp;Itemid=14</a>		
<b>Collection</b>	<b>Insects</b>	<b>81</b>	(living species available)
		<b>1475</b>	(living species catalogued)
		<b>2950</b>	(non-living species available and catalogued)
	<b>Fungi</b>	<b>18</b>	(living species available and catalogued)
		<b>175</b>	(non-living species available and catalogued)
	<b>Bacteria</b>	<b>17</b>	(living species available and catalogued)
		<b>95</b>	(non-living species available and catalogued)
	<b>Viruses</b>	<b>5</b>	(living species available and catalogued)
		<b>20</b>	(non-living species available and catalogued)
	<b>Nematodes</b>	<b>8</b>	(non-living species available and catalogued)
<b>WDCM</b>	-	<b>Q Standards</b>	?

The CARDI Plant Protection Division conducts researches and gathers data on pests and pest control practices through field-based research, evaluates management practices for key pests, improves upon those practices and integrates the practices into a functional pest management system for Cambodian farmers. Current research and development activities include the identification and curation of herbarium specimens and isolation of pathogens and other principal crops present in Cambodia.

## NCIM: National Collection of Industrial Microorganisms, National Chemical Laboratory (CSIR)

<b>Address:</b>	Dr. Homi Bhabha Road, Pune, Maharashtra, 411 008, India		
<b>Contact</b>	Dr. D.V. Gokhale (Curator) <a href="mailto:dv.gokhale@ncl.res.in">dv.gokhale@ncl.res.in</a>		
<b>Links</b>	Main page:	<a href="http://www.ncl-india.org/ncim/">http://www.ncl-india.org/ncim/</a>	
	Catalogue:	<a href="http://www.ncl-india.org/ncim/catalogue.jsp?mid=29">http://www.ncl-india.org/ncim/catalogue.jsp?mid=29</a>	
<b>Collection</b>	<b>Insects</b>	<b>81</b>	(living species available)
		<b>1475</b>	(living species catalogued)
		<b>2950</b>	(non-living species available and catalogued)
	<b>Fungi</b>	<b>18</b>	(living species available and catalogued)
		<b>175</b>	(non-living species available and catalogued)
	<b>Bacteria</b>	<b>17</b>	(living species available and catalogued)
		<b>95</b>	(non-living species available and catalogued)
	<b>Viruses</b>	<b>5</b>	(living species available and catalogued)
		<b>20</b>	(non-living species available and catalogued)
	<b>Nematodes</b>	<b>8</b>	(non-living species available and catalogued)
<b>WDCM</b>	<a href="#">WDCM3</a>	<b>Q Standards</b>	?

NCIM consists of around 3700 strains of algae, bacteria, fungi and yeast. Only non-pathogenic cultures are maintained in the collection. NCIM is one of the largest culture collections in India and is a member of World Federation for Culture Collections (WFCC).

Website with catalogue and detailed information on available facilities; laboratory equipment; literature on assay methods, media and maintenance and production.

## CCAP: Culture Collection of Algae and Protozoa, Scottish Association for Marine Science\*

<b>Address:</b>	Culture Collection of Algae and Protozoa SAMS Research Services Ltd. Dunstaffnage Marine Laboratory, Dunbeg, Argyll, PA37 1QA, UK Tel:(44) 1631 559000
<b>Contact</b>	Rachel Saxon - <a href="mailto:ccap@sams.ac.uk">ccap@sams.ac.uk</a>
<b>Links</b>	Main page: <a href="http://www.ccap.ac.uk/index.htm">http://www.ccap.ac.uk/index.htm</a> Catalogue: <a href="http://www.ccap.ac.uk">http://www.ccap.ac.uk</a>
<b>Collection</b>	<b>Living Cells (algae and protozoa)</b> <b>3000</b> (living species available);
<b>WDCM</b>	<a href="#">WDCM522</a> <b>Q Standards</b> ?

For information visit: <http://www.ccap.ac.uk/index.htm>

**\*incomplete survey**

## The Bacillus Genetic Stock Center (BGSC) The Ohio State University

<b>Address:</b>	Department of Biochemistry, 484 W.12th Ave., Columbus, OH, 43210, USA; Tel.: (1) 614-292-5550
<b>Contact</b>	Daniel R. Zeigler Ph.D. (Director) - <a href="mailto:zeigler.1@osu.edu">zeigler.1@osu.edu</a>
<b>Links</b>	Main page: <a href="http://www.bgsc.org/">http://www.bgsc.org/</a> Catalogue: <a href="http://www.bgsc.org/catalog.htm">http://www.bgsc.org/catalog.htm</a>
<b>Collection</b>	<b>Bacteria</b> <b>2130</b> (living species available and catalogued);
<b>WDCM</b>	<a href="#">WDCM573</a> <b>Q Standards</b> in-house SOPs

Primary mission of the BGSC is to maintain genetically characterized strains, cloning vectors, and bacteriophage for the genus *Bacillus* and related organisms and to distribute these materials throughout the world. The Department of Biochemistry in the College of Biological Sciences at The Ohio State University provides facilities and administrative support. Website with catalogue and strain order information.

## USRCB - Odessa National University; Department of Genetics

<b>Address:</b>	Generala Petrova 74 / 2, Room 10. 65076 Odessa, Ukraine
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<b>Links</b>	<a href="http://wdcn.nig.ac.jp/CCINFO/CCINFO.xml?855">http://wdcn.nig.ac.jp/CCINFO/CCINFO.xml?855</a>
<b>Collection</b>	<b>Fungi</b> <b>280</b> (living species available) <b>Bacteria</b> <b>1335</b> (living species available) <b>Living Cells</b> <b>106</b> (living species available) <b>Others</b> Plasmid - 76; Phages - 40; Vectors - 37; Actinomycetes -264
<b>WDCM</b>	<a href="#">WDCM855</a> <b>Q Standards</b> ?

Unit does not borrow material.

**EMCC: Egypt Microbial Culture Collection, Cairo Microbiological Resources Centre (Cairo MIRCEN), Ain Shams University**

<b>Address:</b>	Faculty of Agriculture, P.O.Box 68, Hadayek Shoubra, Cairo, 11241 Egypt; Tel.: (20) 2-4445 4862		
<b>Contact</b>	Dr. Nabil Magdoub - <a href="mailto:mnmaghome@yahoo.com">mnmaghome@yahoo.com</a>		
<b>Links</b>	Ain Shams University: <a href="http://www.shams.edu.eg/">http://www.shams.edu.eg/</a>		
<b>Collection</b>	<b>Fungi</b>	<b>180</b>	(living species available)
	<b>Bacteria</b>	<b>1199</b>	(living species available)
	<b>Viruses</b>	<b>15</b>	(living species available)
	<b>Others</b>	<b>152</b>	(living species available)
<b>WDCM</b>	<a href="#">WDCM583</a>	<b>Q Standards</b>	?

Information on the WDCM website: <http://wdcm.nig.ac.jp/CCINFO/CCINFO.xml?583>

**FCBP: First fungal culture bank of Pakistan, Dept. of Mycology and Plant Pathology University of Punjab Lahore Pakistan**

<b>Address:</b>	Plant Pathology University of Punjab Lahore Pakistan, Lahore, Punjab, 54590; Pakistan Tel.: (92) 042-9231187		
<b>Contact</b>	Rukhsana Bajwa - - <a href="mailto:fistfcbp@yahoo.com">fistfcbp@yahoo.com</a>		
<b>Link</b>	Institute of Mycology & Plant Pathology: <a href="http://www.pu.edu.pk/departments/default.asp?deptid=53">http://www.pu.edu.pk/departments/default.asp?deptid=53</a>		
<b>Collection</b>	<b>Fungi</b>	<b>180</b>	(living species available)
	<b>Bacteria</b>	<b>1199</b>	(living species available)
	<b>Viruses</b>	<b>15</b>	(living species available)
	<b>Others</b>	<b>152</b>	(living species available)
<b>WDCM</b>	<a href="#">WDCM859</a>	<b>Q Standards</b>	?

Information on the WDCM website: <http://wdcm.nig.ac.jp/CCINFO/CCINFO.xml?859>

**MEAN: Micoteca da Estacao Agronomica Nacional, Estacao Agronomica Nacional - Instituto Nacional de Investigacao Agraria e Pescas**

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<b>Contact</b>	Dr. Maria Cristina Lopes - <a href="mailto:mcc.lopes@sapo.pt">mcc.lopes@sapo.pt</a>		
<b>Link</b>	Instituto Nacional de Investigacao Agraria e Pescas: <a href="http://www.iniap.min-agricultura.pt/">http://www.iniap.min-agricultura.pt/</a> Catalogue: <a href="http://www.iniap.min-agricultura.pt/ficheiros_noticias/Catalogo_MEAN.pdf">http://www.iniap.min-agricultura.pt/ficheiros_noticias/Catalogo_MEAN.pdf</a>		
<b>Collection</b>	<b>Fungi</b>	<b>301</b>	(living species available)
		<b>400</b>	(living species catalogued)
		<b>10</b>	(non-living species available)
<b>WDCM</b>	<a href="#">WDCM881</a>	<b>Q Standards</b>	?
<b>Characterization</b>	Biological and Experimental data	<b>Preservation Method</b>	Freeze-drying

Information on the WDCM website: <http://wdcm.nig.ac.jp/CCINFO/CCINFO.xml?881>. Catalogue available online.

*Institut de Recherche pour le Développement – UMR Génome and Développement des Plantes*

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<b>Contact</b>	Valérie Verdier - <a href="mailto:verdier@ird.fr">verdier@ird.fr</a>		
<b>Links</b>	Institut de Recherche pour le Développement: <a href="http://en.ird.fr/">http://en.ird.fr/</a>		
<b>Collection</b>	<b>Bacteria</b>	<b>300</b>	(living species available and catalogued)
<b>WDCM</b>	?	<b>Q Standards</b>	?
<b>Characterization</b>		<b>Preservation Method</b>	