



***B*IODIVERSITY INFORMATION
RETRIEVAL ACROSS NETWORKED
DATA SETS**

By

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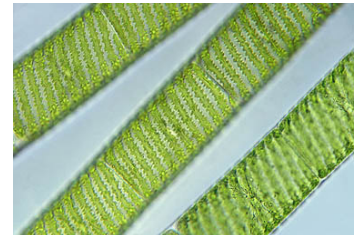
Sir Robert May (1998)

“... The next century will be the ‘Age of Biology’, just as [the twentieth century was] the age of physics and astronomy. Specifically, those countries who best know how to correlate, analyze and communicate biological information will be in the leading position to achieve economic and scientific advances.”



*B*iodiversity information:

disperse
unreported
inaccessible



BIODIVERSITY INFORMATION: MALAYSIAN PERSPECTIVE



Identified as one of the world's twelve mega-diversity areas with extreme rich biological resources

*over 15,000 species of higher plants,
300 species of mammals,
254 species of breeding birds,
198 species of amphibians,
379 species of reptiles,
over 150,000 species of the invertebrates,
over 4,000 species of marine fishes
449 species of freshwater fishes in Malaysia*

(Earth Trends, 2003)



Current status

Some institutions have information documented in the form of **databases**, while other institutions are looking into it

Databases are in **heterogeneous** formats.

Few databases are on the Web, while many are available **offline**

Some of these databases are well-structured, others are largely project /species specific and/or **unstructured**

These databases exist **independently**

There is no **meta-data** (data- dictionary)



NO FRAMEWORK TO LINK THE
SCATTERED DATA SO AS TO
FACILITATE EXCHANGE OF DATA
AMONGST THE DIFFERENT DATABASES
AVAILABLE IN THE COUNTRY.

Need to overcome this setback....

HOW??



*Dissemination and retrieval of
information in a networked
environment....*

COMMUNICATION of biodiversity
information (*biodiversity informatics*)

LINK all the disperse information
clusters in remote and distributed
medium



THE SOLUTION





Rationale for indigenous DATABASE INTEGRATION SYSTEM

Implementation issues existing
systems
No control



INDIGENOUS framework for integrating **DISTRIBUTED**
HETEROGENEOUS *relational*
biodiversity databases

to facilitate biodiversity data sharing among the scientific
contemporaries especially in Malaysia.

Philosophy:

Database **KEPT & MAINTAINED** by DATA OWNER

SIMPLICITY is stressed to offer a **USABLE** system for the
scientific community in Malaysia and future integration with
other global networks.



The FOCUS

D DEVELOPMENT OF A NEW DATABASE INTEGRATION
SYSTEM

D DEVELOPMENT OF BIODIVERSITY DATABASES
ACCORDING TO REQUIREMENTS SET BY PARTNERS



***RELATIONAL
BIODIVERSITY
DATABASES***



PARASITE DETAIL

Back To Search

Bifurcochaptor baungi Lim & Furtado, 1983

Synonyms : **Bifurcochaptor baungi**

Catalog Number	P0001
Genus	Bifurcochaptor
Species	baungi
Authority	L. H. LIM and J. I. FURTADO 1983
Family	Dactylogyridae
Class	Monogenea
Order	Dactylogyridae
Phylum	Platyhelminthes
Kingdom	Animalia
Host	Mytilus nemusari
Location On Host	Gills

MALYSIAN INDIGENOUS FERN

This online database is developed especially for user to identify some fern species that distributed commonly in Malaysia. All the information is taken from some references from each on fern of Malaya and Peninsular Malaysia.

Many ferns have such an extraordinary appearance that are often unrecognizable species. We could not mistake them for any kind of plant. But many others ferns are used as food different from the characteristic ferns and some even popular food for people around those ferns in the forest.

Ferns are part of a group of plants known as the Pteridophyta, characterized by a life cycle rather of two distinct, independent, alternate generations. The gametes (egg and sperm) are released from the sporangia and are known as antherozoids. They produce zygotes.

SEARCH

Gallery

Herbarium of Zingiberaceae

Alpinia aquatica

Scientific Name: Catalog Number:

Synonym: Collector Number:

General:

Description:

Kingdom:

Phylum:

Class:

Order:

Family:

Locality:

Altitude:

Date:

Observation:

Collector Name:

Institute:

Number of Record:

SEARCH GALLERY LOG IN

INTRODUCTION TO SEAWEEDS

Algae may be divided into two biological groups: planktonic and benthic algae. (Levring, 1969). By tradition, the term "seaweeds" refers to macroscopic, multicellular marine algae. (Lobban & J. 1994). However, not all classified seaweeds consist of those two groups. There are three traditional divisions based on algal pigments, cell wall structure, and mode of reproduction: Rhodophyta (red algae), Chlorophyta (green algae), and Phaeophyta (brown algae).

Algae in salt or brackish water, on glass and shell. However seaweeds are most

Snakes of Peninsular Malaysia

- archival records

Welcome, Guest. Please login to access administrator authority.

Username:

Password:

login

Introduction to Snakes of Peninsular Malaysia - Archival Records Database

This database of archive records on the Snakes of Peninsular Malaysia was developed as part of a broader Biodiversity Database Information System in the Institute of Biological Sciences, University of Malaya. This is a collaborative project between the Institute for Medical Research and the University of Malaya. The database contains more than 500 records of 100 species of snakes collected in the Malay Peninsula and curated in the Biomedical Museum of the IMR.

Menu

- Home
- Search record
- Classification
- Other Information
- Picture Gallery
- Reference
- Acknowledgement

Related links

- UM bioinformatics division
- Institute of Medical Research

For more information

Snakes of Peninsular Malaysia

In Malaysia, there are about 129 species of snakes belonging to 8 families.

- Typhlopidae
- Aniliidae
- Xenopeltidae
- Boidae
- Colubridae
- Viperidae
- Elapidae
- Hydrophiidae

FISH DATABASE

Welcome to Fish Database!

A fish is an animal which lives in water breathes by means of gills.

Some fish have lungs and breathe air. [more](#)

SEARCH

Home Forum Glossary Contact LivingWeb FishBase

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The Land of Moths

University of Malaya

Monday, May 12, 2008 9:51 PM

username:

password:

login

SEARCH

Family Bombycidae
Please select Search

Family Lasiolepididae
Please select Search

Family SpHINGIIDAE
Please select Search

Welcome to The Land of Moths

A moth is an insect closely related to the butterfly. Both are of the order Lepidoptera.

A moth can be differentiated by two very obvious characteristics. The first would be the resting posture. For the moths, usually they hold wings flat when resting while for butterflies, they hold wings together above the body when resting. They are some exceptions however such as the geometrid moths which also hold their wings up in a butterfly-like fashion when resting. Butterflies in the lycanid subfamily Riodininae hold their wings flat during resting.

Another obvious characteristic that help to identify moths from butterflies is the colour. Moths has duller colours compared to butterflies. However, there are also exceptions for moths, especially day-flying ones that are colourful while some butterflies are dark brown with few markings.

WELCOME TO SOUTHEAST ASIA & BORNEO BATS DATABASE

HOME SEARCH RECORD CONTACT US

Bats are mammals in the order Chiroptera. Their most distinguishing feature is that their forelimbs are developed as wings, making them the only mammal in the world naturally capable of flight; other mammals, such as flying squirrels and gliding phalangers, can glide for limited distances but are not capable of true sustainable flight. The word Chiroptera can be translated from the Greek words for "hand wing," as the structure of the open wing is very similar to an outspread human hand, with a membrane (patagium) between the fingers that also stretches between hand and body.

There are estimated to be about 1,100 species of bats worldwide, accounting for about 20% of all mammal species.

About 70 percent of bats are insectivorous. Most of the remainder feed on fruits and their juices; three bat species eat blood and some prey on vertebrates.

Contact Person : Dr Tajuddin Abdullah (abduhahmet@gmail.com)

DATABASE INTEGRATION





PROPOSED DATABASE INTEGRATION

SYSTEM

- *Links remote databases on networked environment.*
- *Supports heterogeneous data format.*
- *Supports heterogeneous database management systems.*
- *Links databases hosted in Windows and UNIX based platforms.*
- *Provides data security for database owners by allowing them to keep and maintain their own data and to choose information to be shared and linked.*



PROTOTYPE

Microsoft Windows

ASP

PHP

XML

HTML

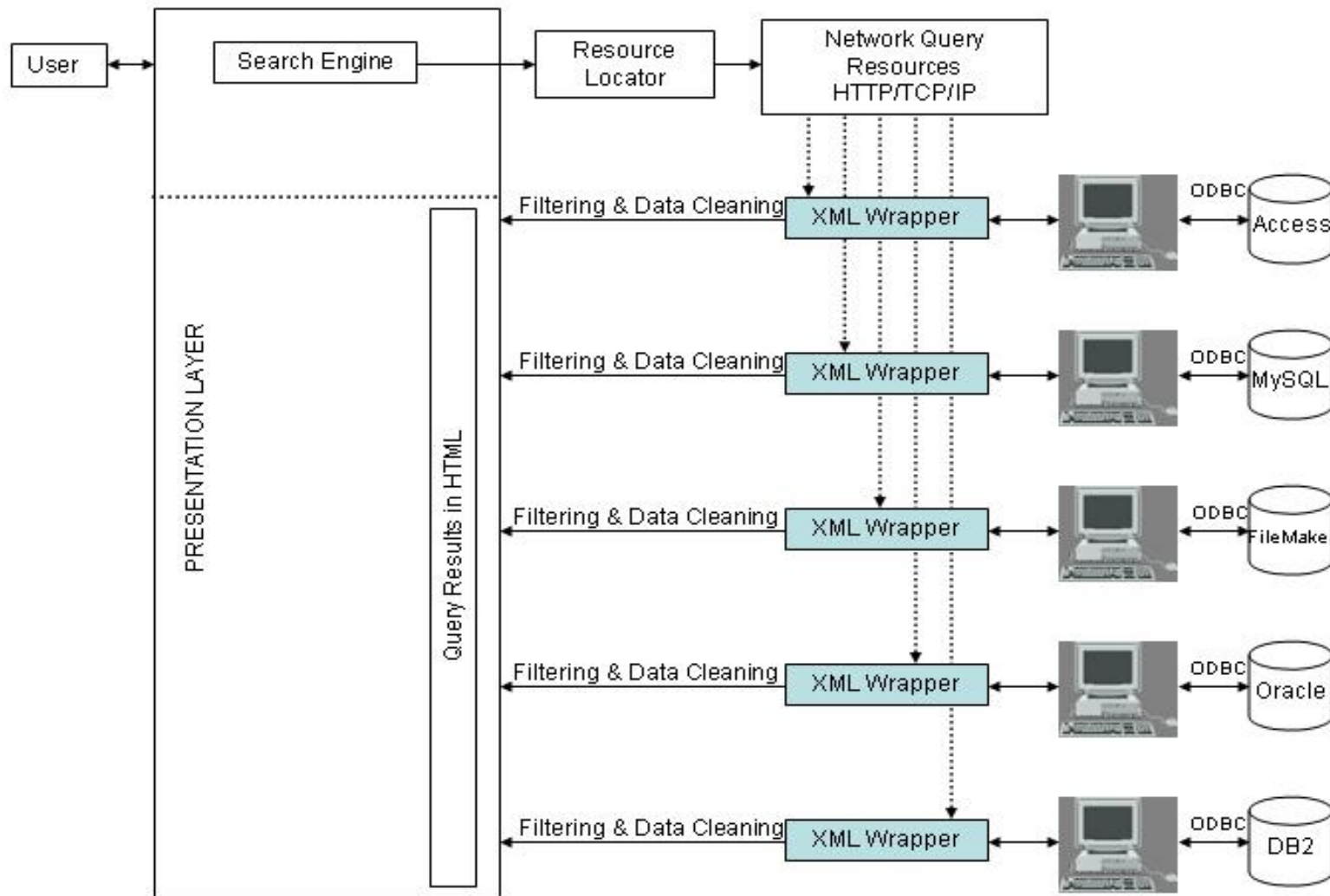
VBScript and Jscript

DBMS- FileMaker, mySQL, DB2..



Search Mechanism

ARCHITECTURE



SUMMARY

- a. Created data format & relational biodatabases
- b. Developed indigenous integration system

- c. In summary

Achieved objectives set out which are:-

- *Links remote databases on networked environment.*
- *Supports heterogeneous data format.*
- *Supports heterogeneous database management systems.*
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FUTURE FOCUS

To further develop & enhance this biodiversity content architecture for our country

- ❖ e-library (Parasitofaunae Malaysiana)
- ❖ Data-security
- ❖ Use of Semantic technology
- ❖ Populate Relational Databases



RESEARCH PROJECTS

Parasites Informatics Network System (PINS)

In our effort to aid research in Parasitology in Malaysia we have developed PINS which is essentially a parasite taxonomic database with inputs from experts in the field who will maintain their respective database with technical assistance from us. We will be incorporating into this database related IT Alternatives to Taxonomy which are currently developing as well as ecological and biological data which will be linked semantically.

[Sarinder Kaur & Lim LHS and other researchers]



Image & text recognitions for taxonomy: retrieving, managing, enhancing and recognizing different types of images

This project is initiated to develop an image-recognition system to aid in species identifications (taxonomy). It is first necessary to develop a database to store images in different formats either from our research or retrieved from different sources. The retrieved images will probably have to be enhanced (if necessary) for image recognition. Our query to search and capture images from publications will be textual in nature since most of the images and illustrations are tagged textually. The system we are developing is for monogenean species, a parasitic flatworm.

[Arpah (PhD candidate), Sarinder Kaur & Lim LHS]



2-D to 3-D modeling of organisms for structural morphology

Visualisation in 3-D provides more information on the spatial relationships of objects or structural morphological features in the case of organisms. 3-D visualization is important in understanding structural and functional morphology and also important for taxonomic and identification purposes. The aim of this study is to construct 3-D models from 2-D images. In this study several softwares capable of doing this have been evaluated and we are currently using 3-d Max programme because of its advantage of being able of rendering irregular shapes using polygons.

[Teo Bee Guan (MSc candidate), Lim LHS, Sarinder Kaur]



Image recognition using DAISY

This project looks into using an available software on image recognition for taxonomy to aid in identifications. The group of interest is to use the software to image moths which have different shapes, sizes and colour patterns. This project involves setting up a database of selected groups of moths.

[Evelyn (MSc candidate), Sarinder Kaur & Lim LHS]



THANK YOU

