Convention on Biological Diversity

United Nations Decade on Biodiversity

Implementing the Strategic Plan for Biodiversity through the National Biodiversity Strategies and Action Plans (NBSAPs)

Document Adoption

Items L-2 to L-20 Adopted at Final COP13 Plenary

Convention on Biological Diversity

Life in harmony, into the future
COP10/MOP5 AICHI-NAGOYA, JAPAN 2010

CBD COP 13 outcomes

·The UN Biodiversity Conference marked the move towards enhanced implementation of the Strategic Plan and Aichi Biodiversity Targets through decisions to mainstream biodiversity into productive sectors, including agriculture, fisheries, tourism and forests, and promote integration of the Convention and its Protocols through the organization of concurrent meetings. In addition, the Conference considered a series of items on emerging technologies, including synthetic biology, gene drives and digital sequence information on genetic resources, paving the way for ensuring the Convention's relevance in environmental governance·

SUMMARY OF THE UN BIODIVERSITY CONFERENCE: 2-17 DECEMBER 2016

http://www.iisd.ca/download/pdf/enb09678e.pdf

COP13
COPMOP8
COPMOP2
CANCUN,
MEXICO 2016

MAINSTREAMING BIODIVERSITY FOR WELL-BEING
CONVENTION ON BIOLOGICAL DIVERSITY

SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

Classical Taxonomy and DNA Barcoding
both are digitizing the living world

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- DNA Barcoding is generating a wealth of computer data….but many of the sequences are not identified to species level…dark taxa

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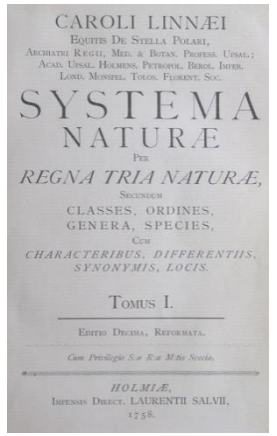
- much of taxonomic descriptions are still offline….dark text


CAROLI LINNÆI
EQUITIS DE STELLA POLARI,
ARCHIATRI REGII, MED. & BOTAN. PROFESS. UPSAL.;
ACAD. UPSAL. HOLMENS. PETROPOL. BEROL. IMPER.
LOND. MONSPEL. TOLOS. FLORENT. SOC.
SYSTEMA
NATURÆ
PER
REGNA TRIA NATURÆ,
SECUNDUM
CLASSES, ORDINES,
GENERA, SPECIES,
CUM
CHARACTERIBUS, DIFFERENTIIS,
SYNONYMIS, LOCIS.
TOMUS I.
EDITIO DECIMA, REFORMATA.
Cum Privilegio S.æ R.æ M.tis Sveciæ.
HOLMIÆ,
IMPENSIS DIRECT. LAURENTII SALVII,
1758.

Classical Taxonomy and DNA Barcoding
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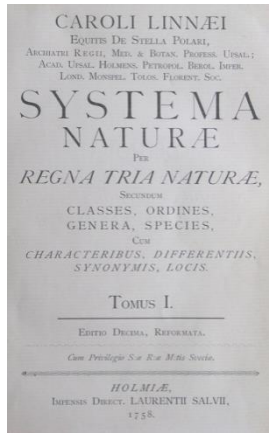
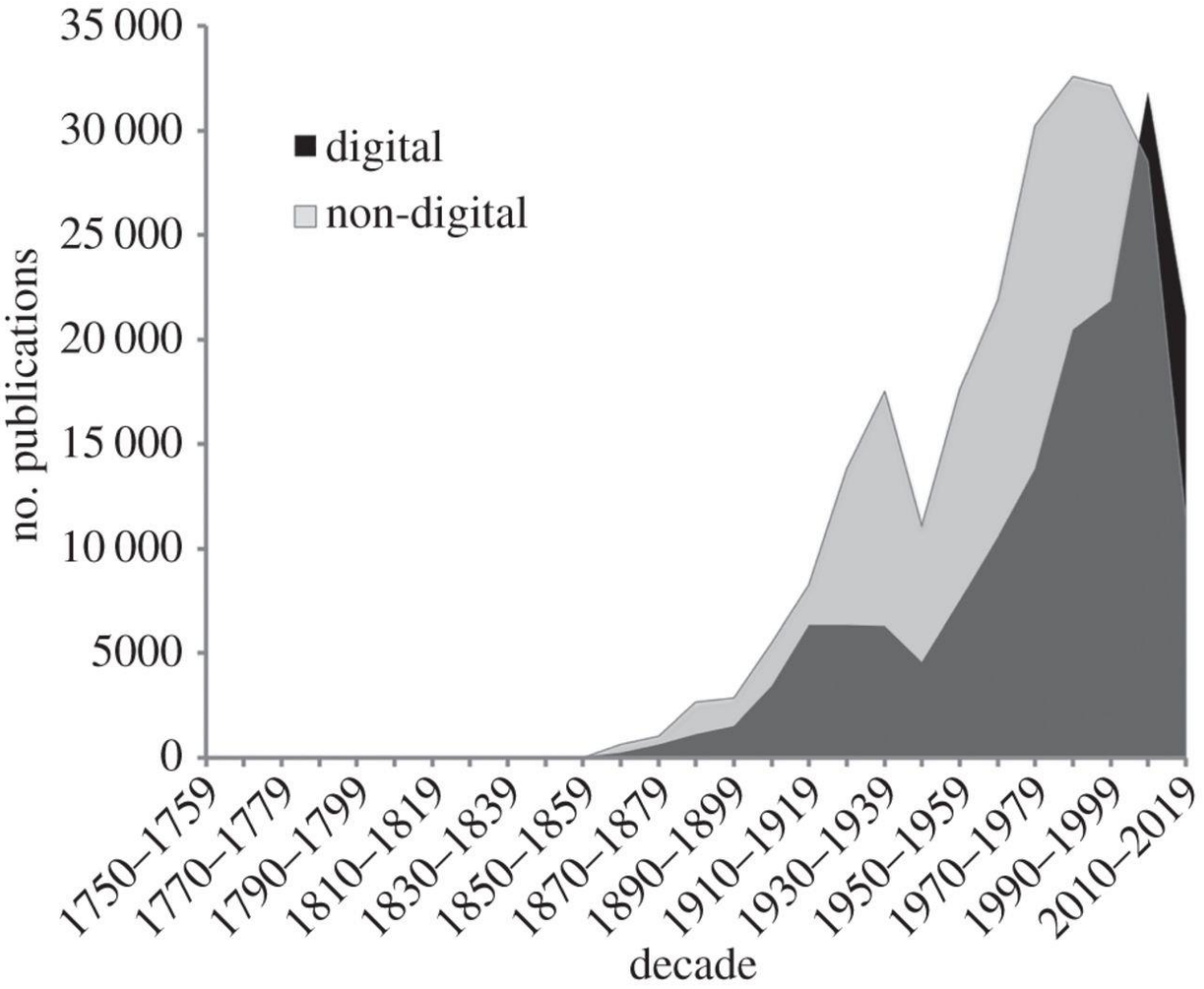
- DNA Barcoding is generating a wealth of computer data….but many of the sequences are not identified to species level…dark taxa

- much of taxonomic descriptions are still offline….dark text



- Voucher specimens are potential link…..and need serious verification

Number of taxonomic publications in BioNames for each decade, grouped by whether the publication has a digital identifier (e.g. a DOI, a link to JSTOR, BHL, BioStor, etc.).



Roderic D. M. Page Phil. Trans. R. Soc. B 2016;371:20150334

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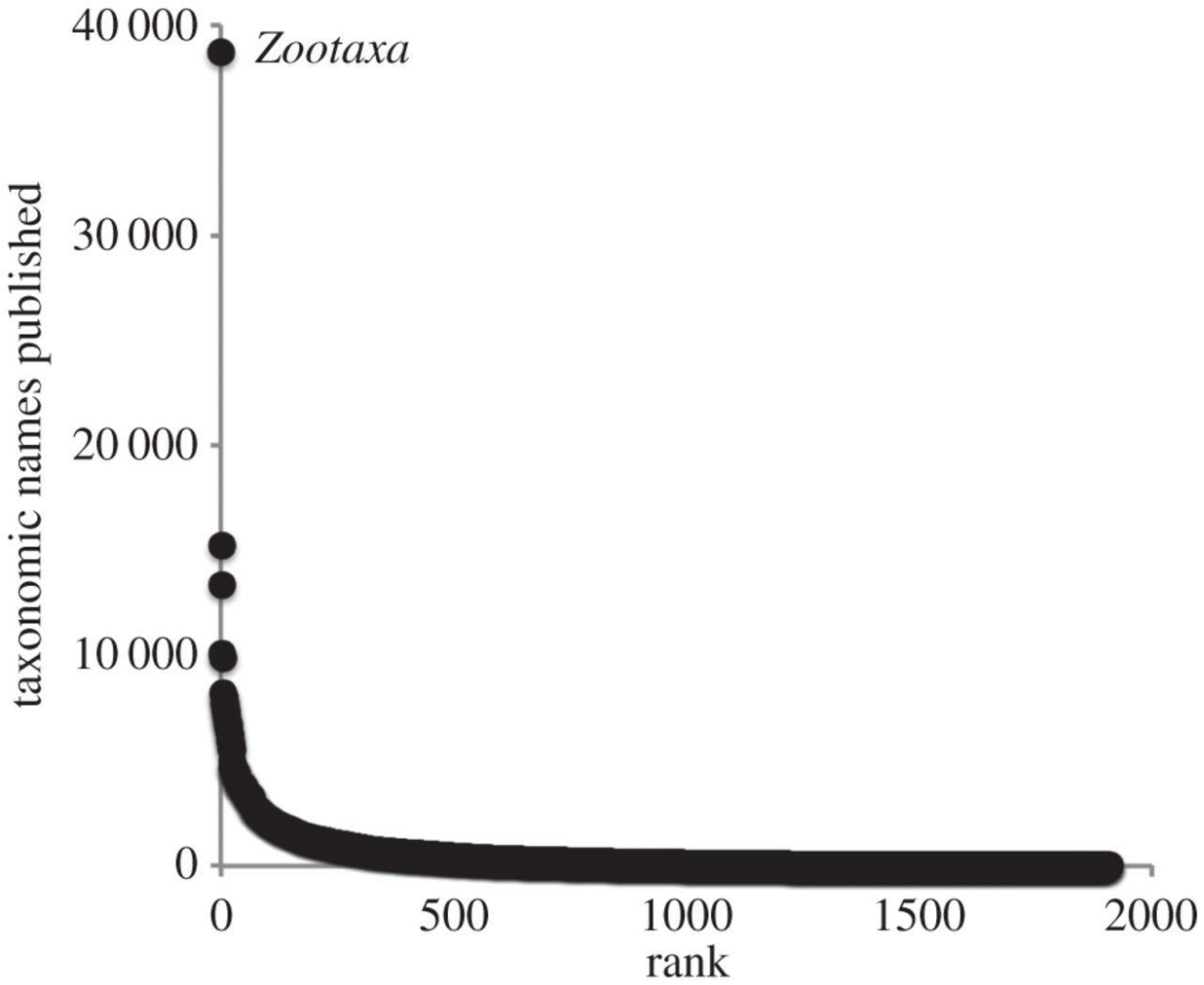
PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B

Number of taxonomic names published in each journal plotted against rank order for that journal.



Roderic D. M. Page Phil. Trans. R. Soc. B 2016;371:20150334

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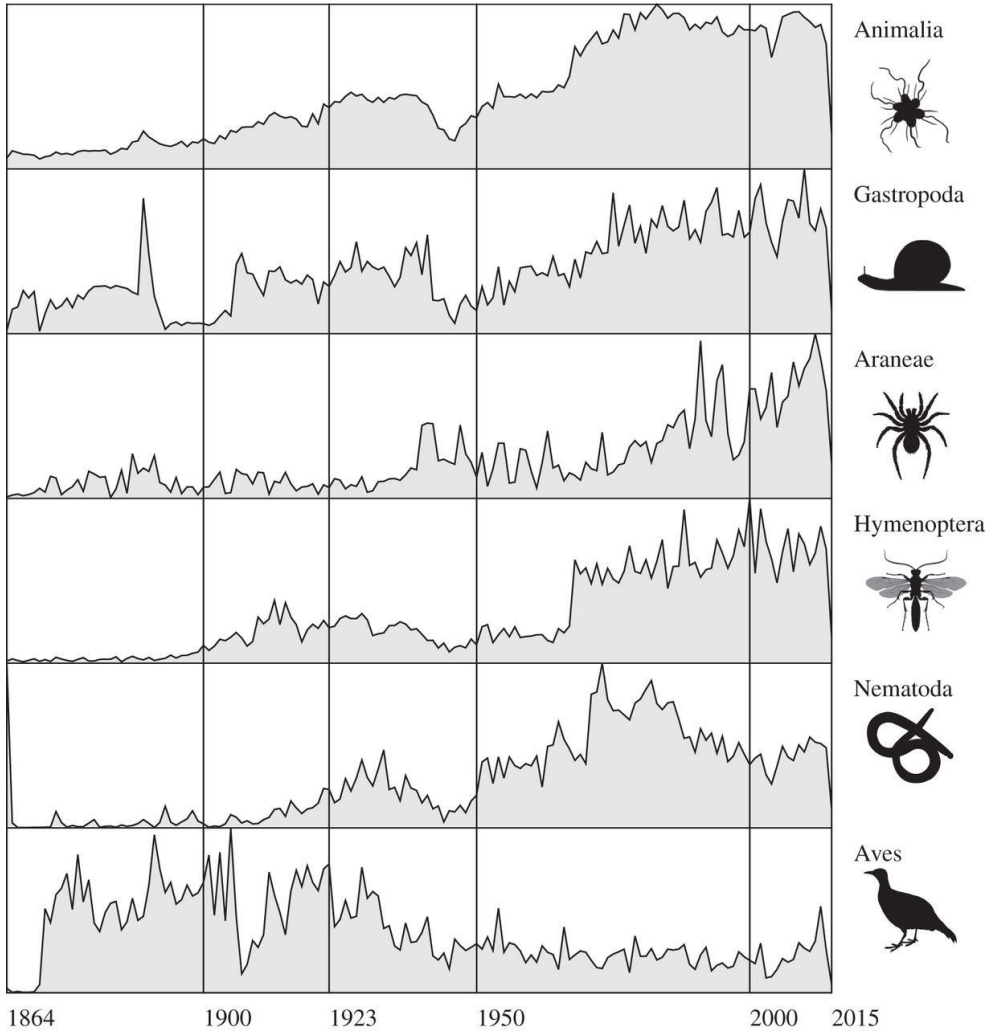
PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B

Trends of numbers of new names published each year for animals as a whole, and various taxonomic groups based on data in Index to organism names (ION) and BioNames (1923 is the year most published works became out of copyright in the USA).



Roderic D. M. Page Phil. Trans. R. Soc. B 2016;371:20150334

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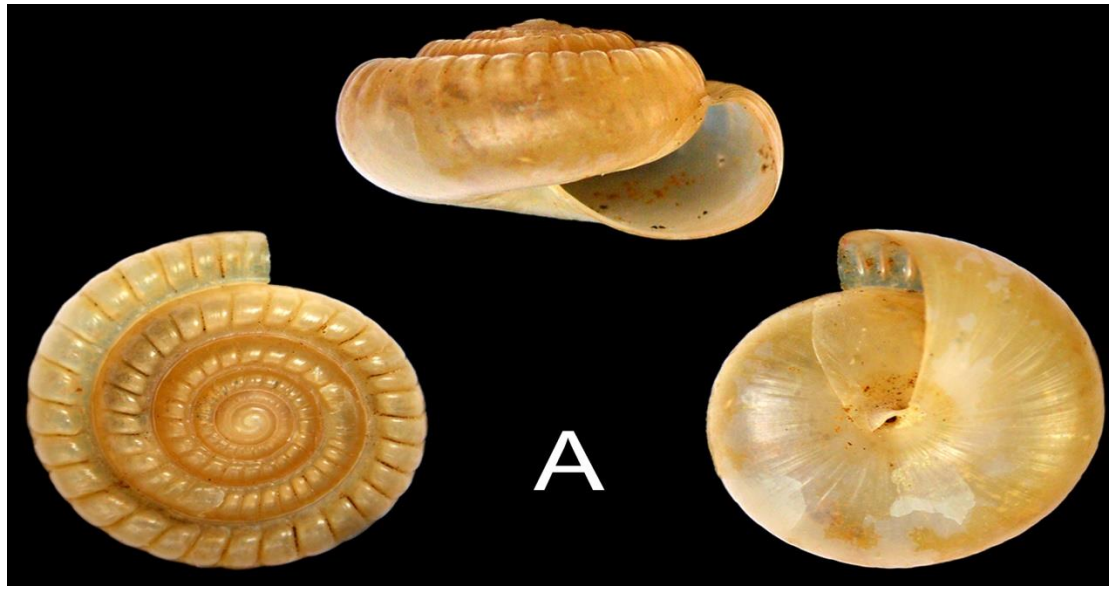
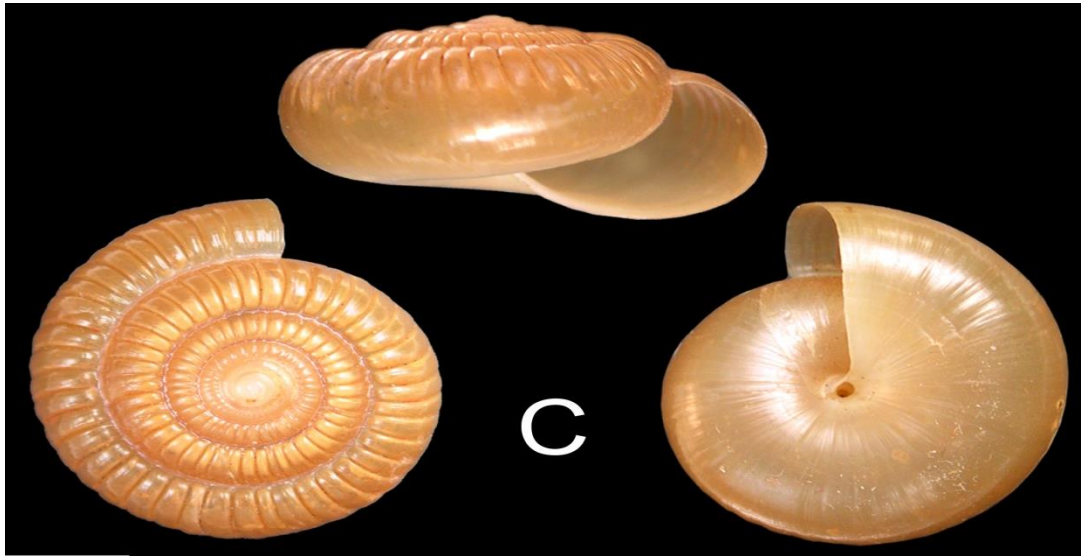
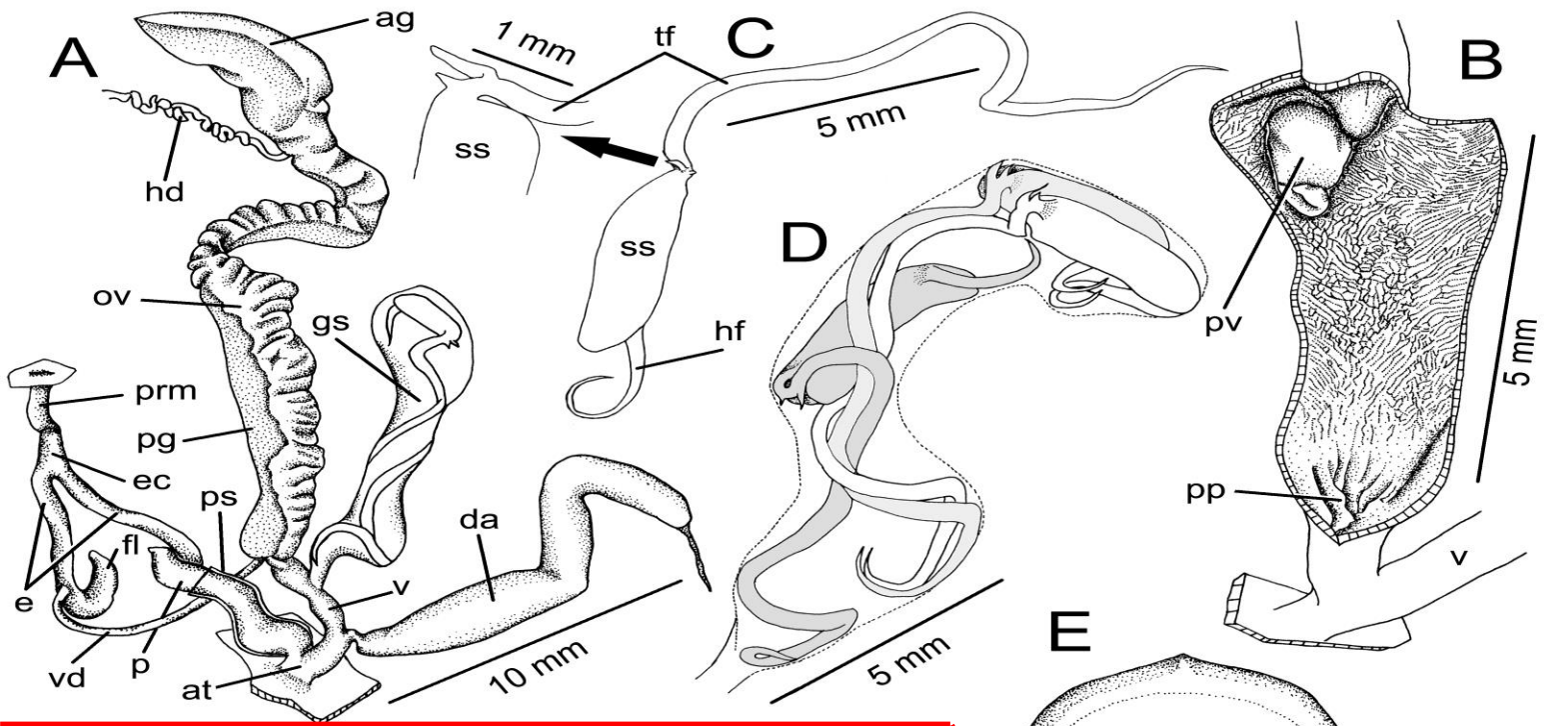
(Sutcharit and Panha), *2008*

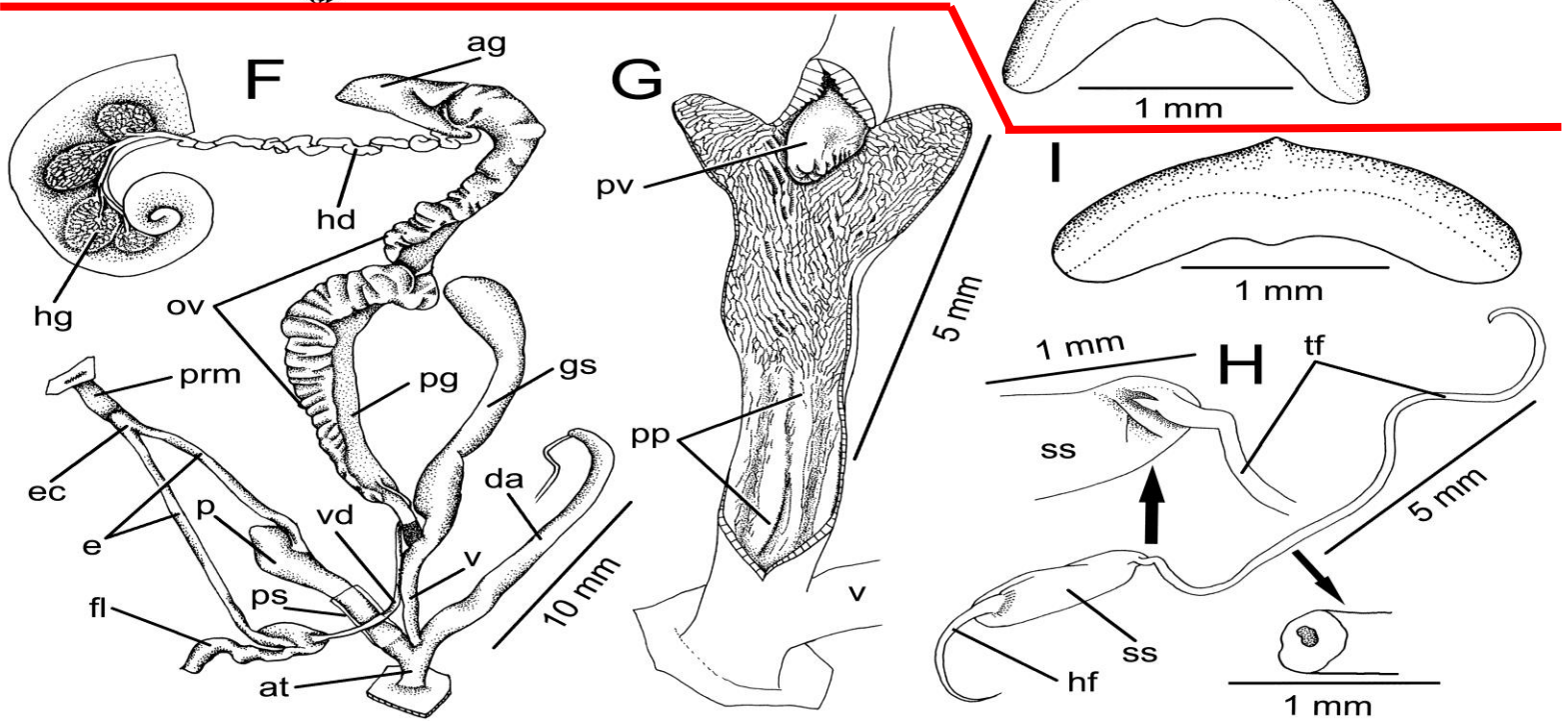
Sarika diadema

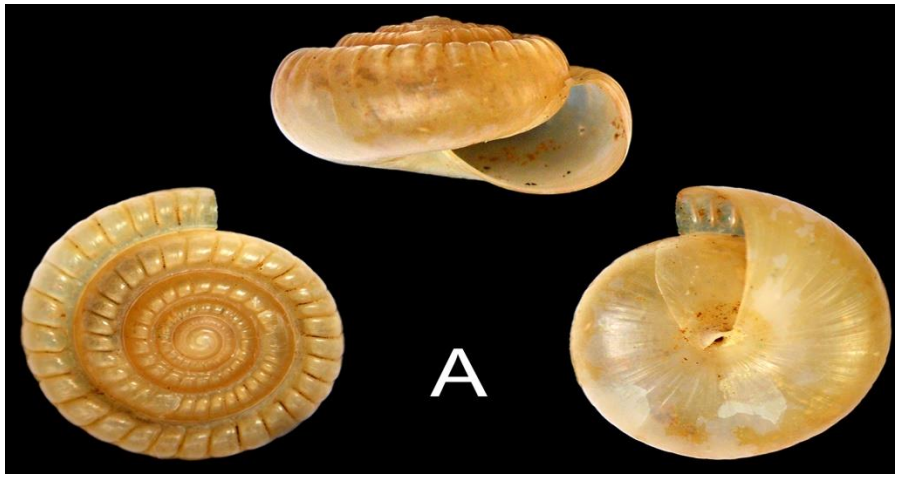


Sarika asamurai

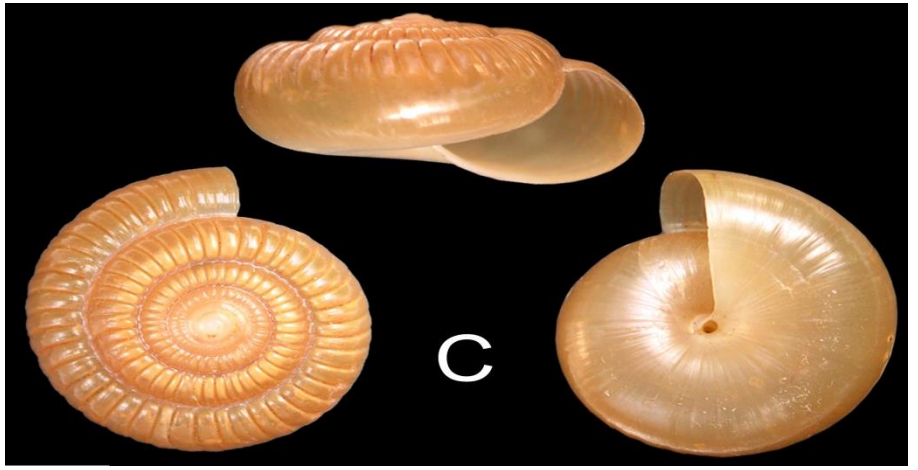








Sarika diadema



Sarika asamurai

A. arenulus

M. trangensis

A. hayod

A. comptus

M. songkhlaensis

M. grandipenes

A. mekongianus

Po. corethrurus

Glyphidrilus sp.

cocoon

Amynthas sp.

P. literalis

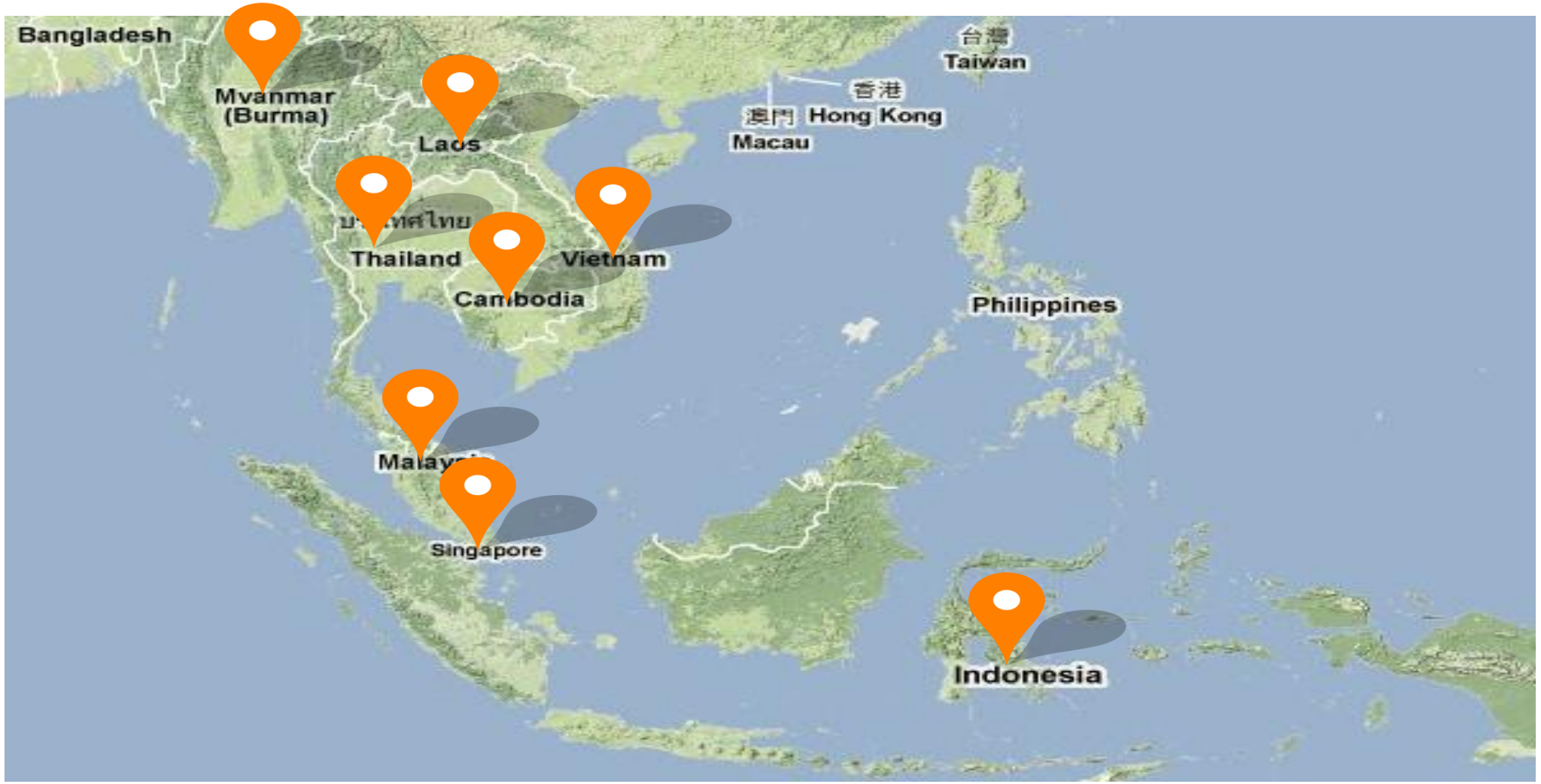
Glyphidrilus sp.

A. thakhantho

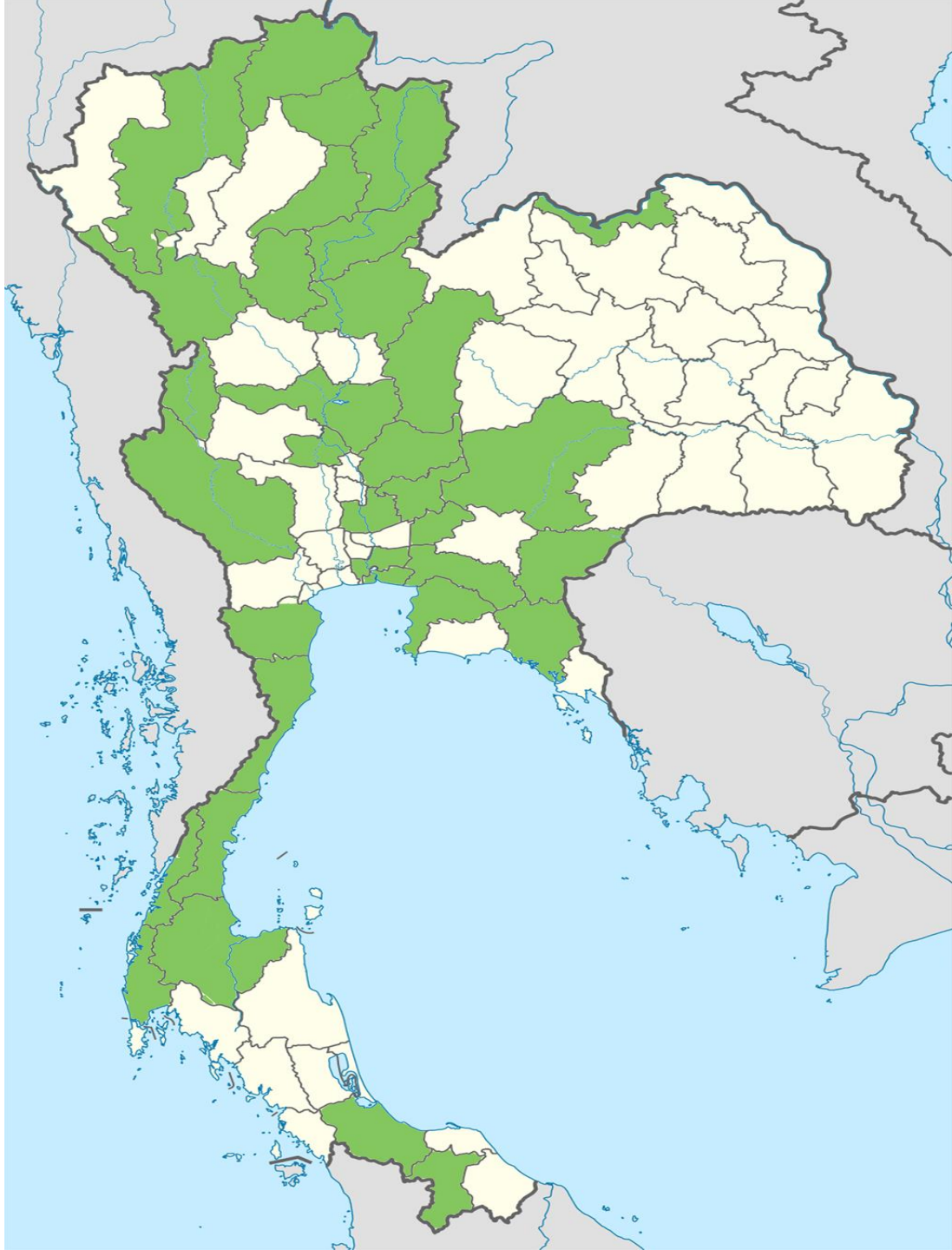
The common Southeast Asian earthworm

- **Scientific name**: *Metaphire peguana* (Rosa, 1890)
- *Pheretima peguana* Stephenson, 1923
- **Common name**: -
- **Thai name**: ขี้ตาแร่
- **Soil niche**: endogeic
- **Status**: cosmopolitan
- **Length**: 6-22 cm
- **Segment**: 108 ± 16

Distribution map of *Metaphire peguana*

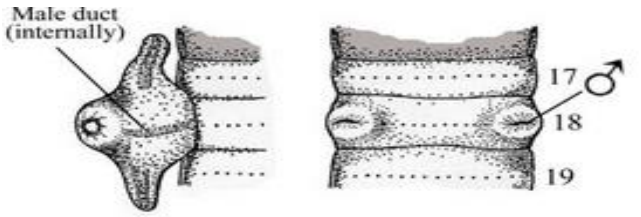


Distribution map of *M. peguana* in Thailand

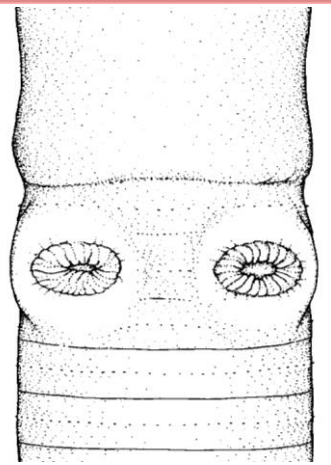


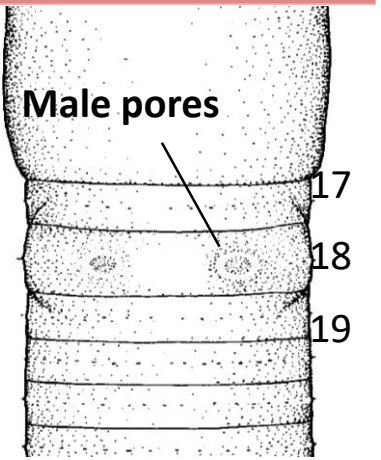
Amynthas and *Metaphire*

Characters	*Metaphire*	*Amynthas*
Setae	Numerous per segment	Numerous per segment
Clitellum	14-16	14-16
Male pores	Segment 18, invaginate	Segment 18, simple superficail
Spermathecae	With diverticulum	With diverticulum
Copulatory pouches	present	absent

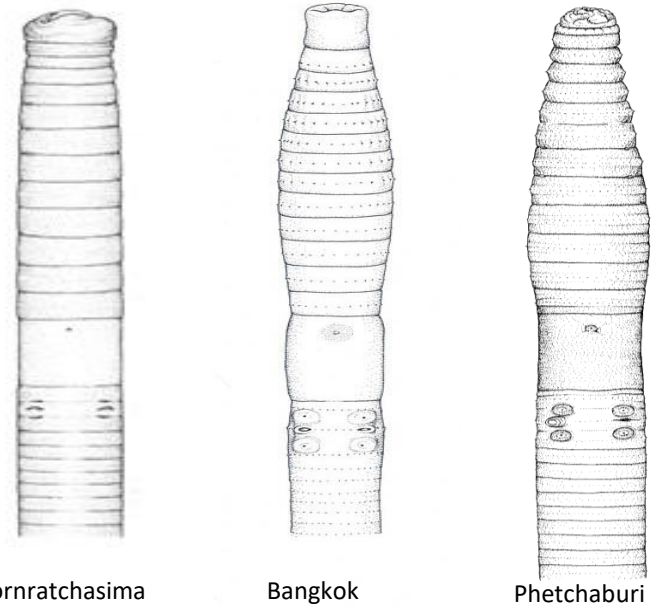


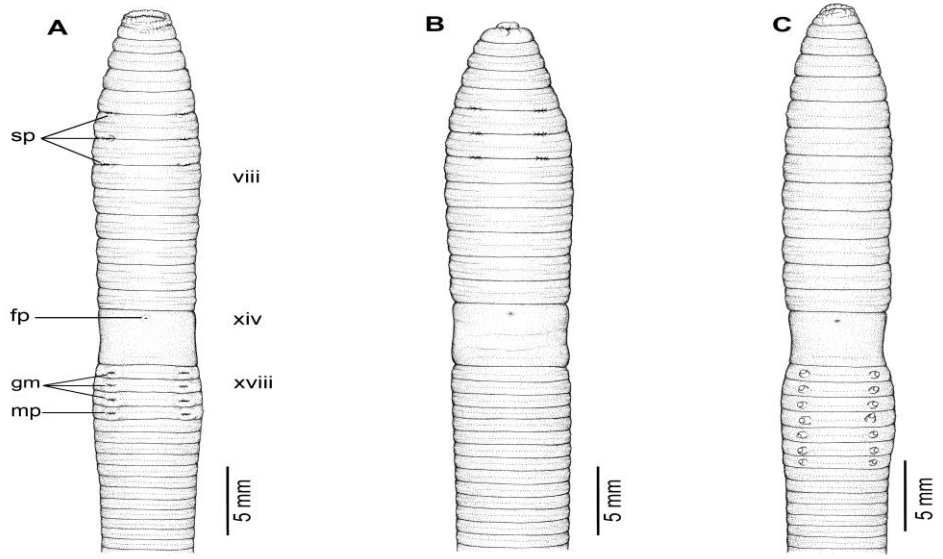
Metaphire schmardae with everted copulatory pouch (lhs) and regular male field (after Hatai & Ohfuchi, 1936).

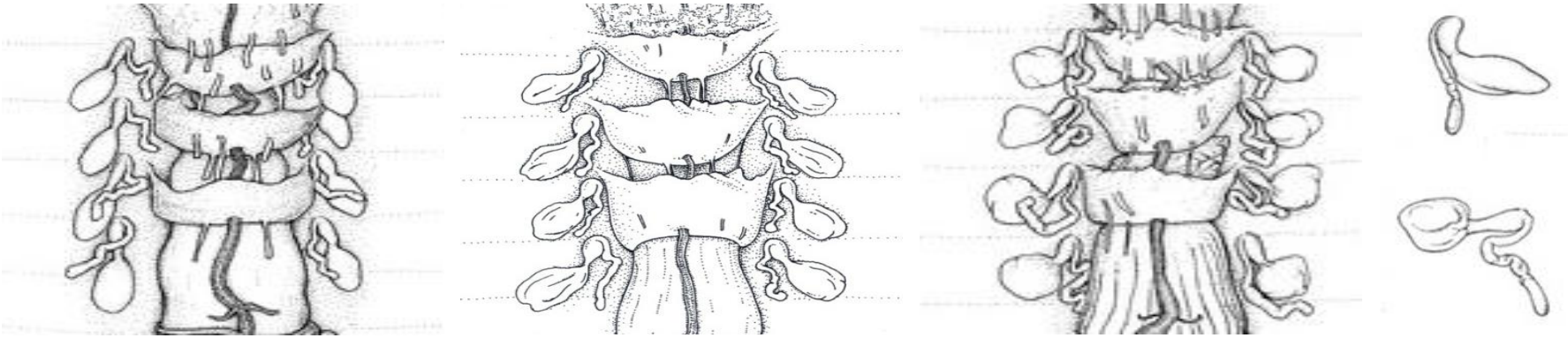




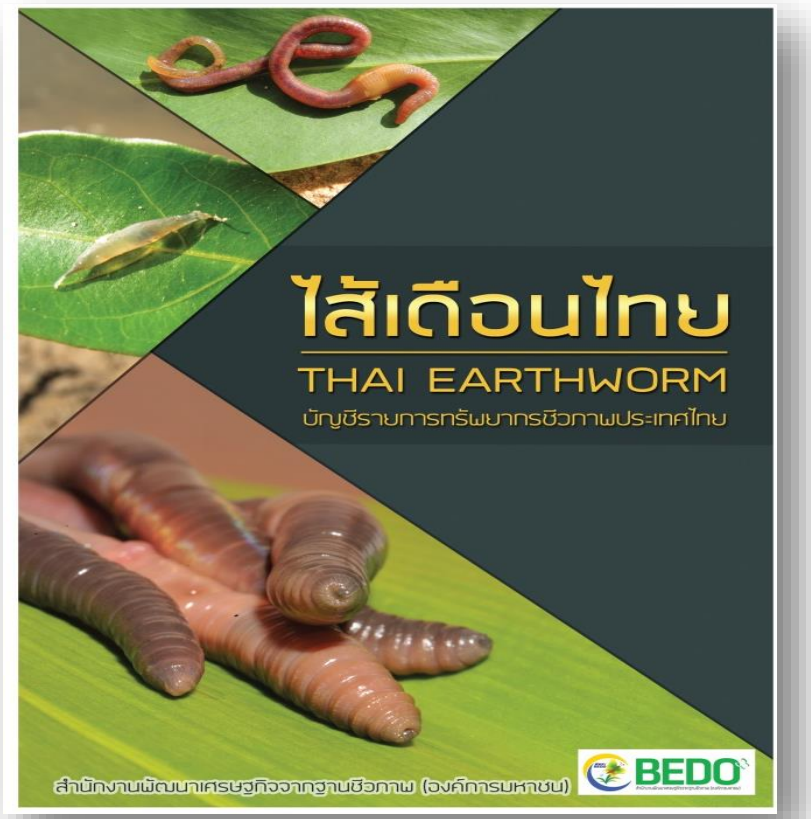
Intraspecific variation

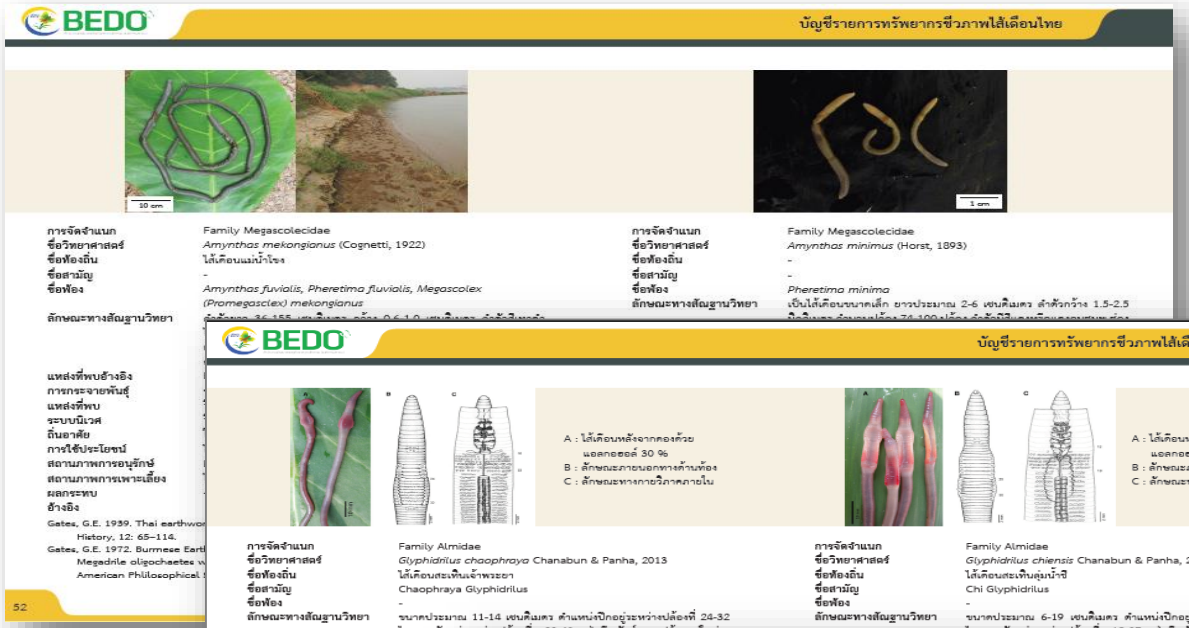






บัญชีรายการทรัพยากรชีวภาพ: ไส้เดือนไทย





European Journal of Soil Biology 81 (2017) 39–47

Contents lists available at ScienceDirect

European Journal of Soil Biology

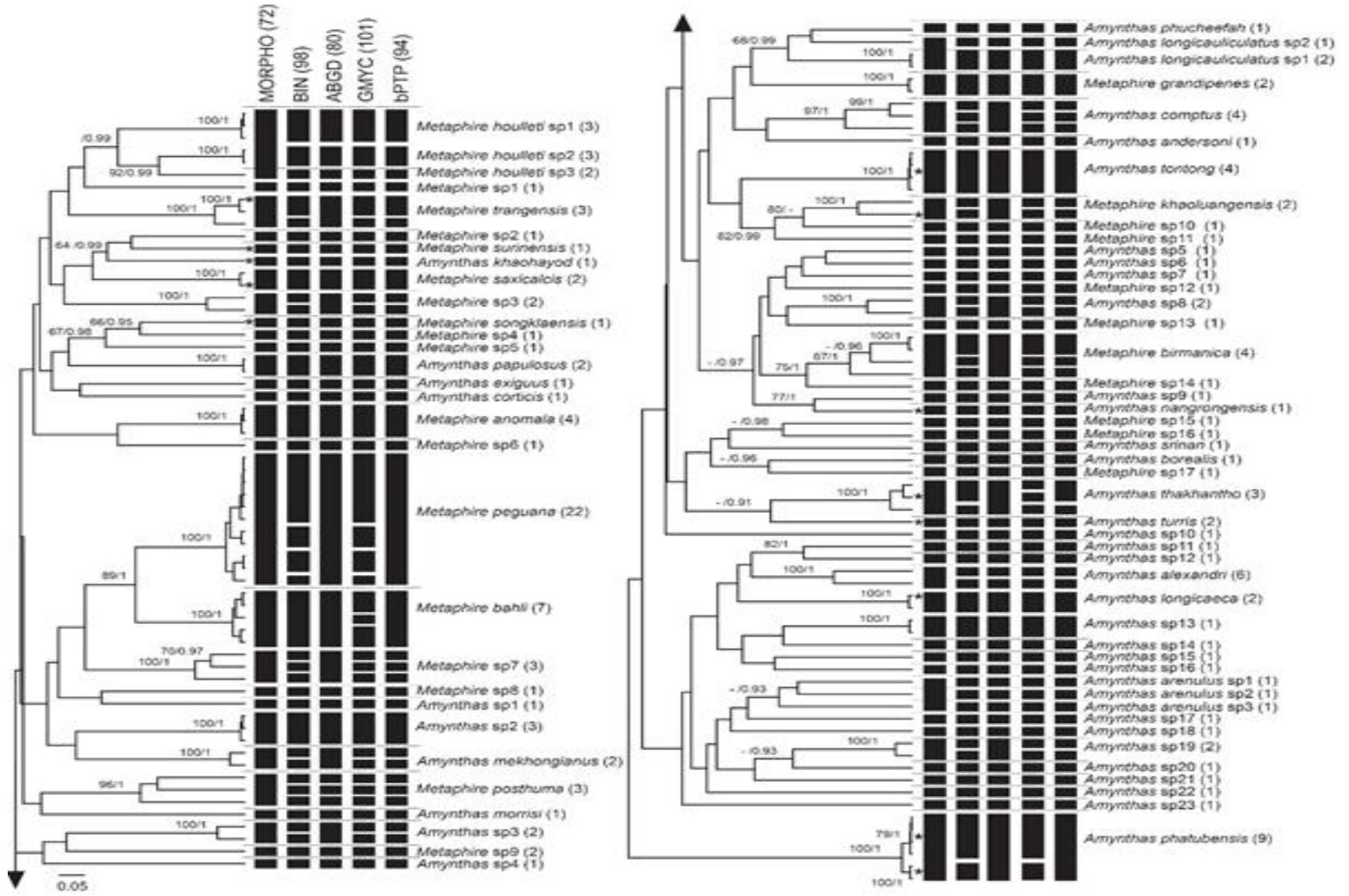
journal homepage: http://www.elsevier.com/locate/ejsobi

DNA barcoding of the Thai species of terrestrial earthworms in the genera *Amynthas* and *Metaphire* (Haplotaxida: Megascolecidae)

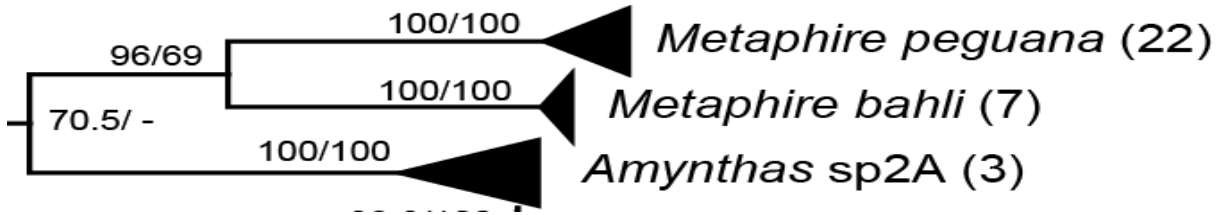
Ekgachai Jeratthitikul [a, 1], Ueangfa Bantaowong [a, b], Somsak Panha [a, *]

[a] *Animal Systematics Research Unit, Department of Biology, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand*
[b] *Division of Biology, Faculty of Science and Technology, Rajamangala University of Technology Thanyaburi, Pathumthani, 12110, Thailand*

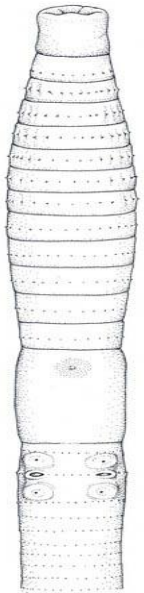
- 77 candidate species for *Metaphire*
- 46 for *Amynthas*
  - 29 described species
  - 48 unknown species
  - 3 complex species



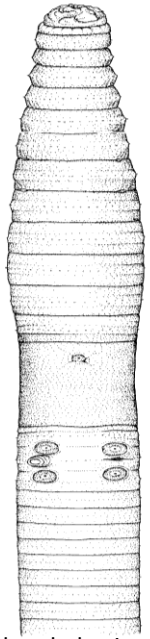
Results and discussions



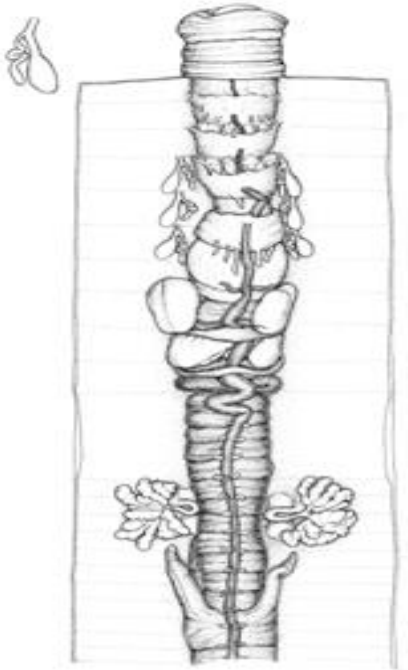
Nakornratchasima



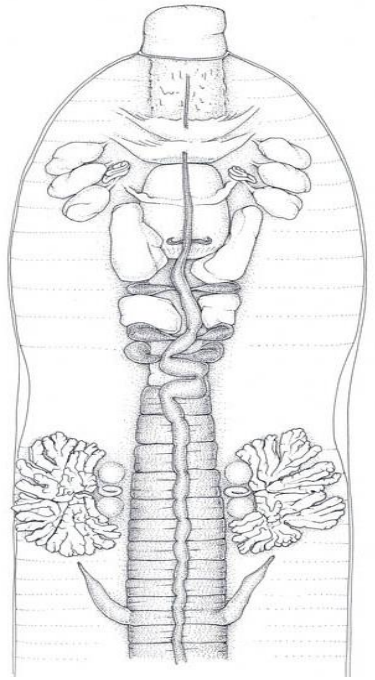
Bangkok



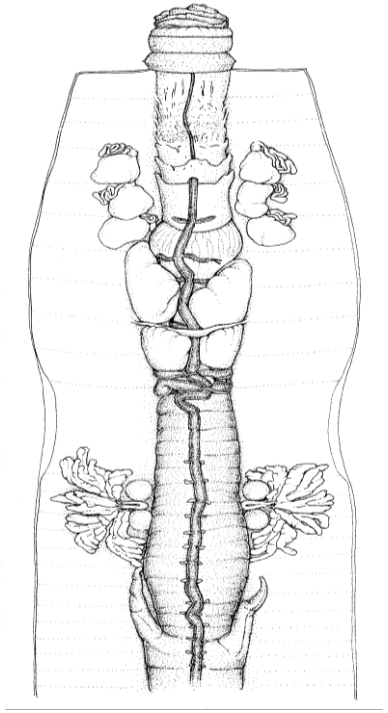
Phetchaburi



Nakornratchasima



Bangkok

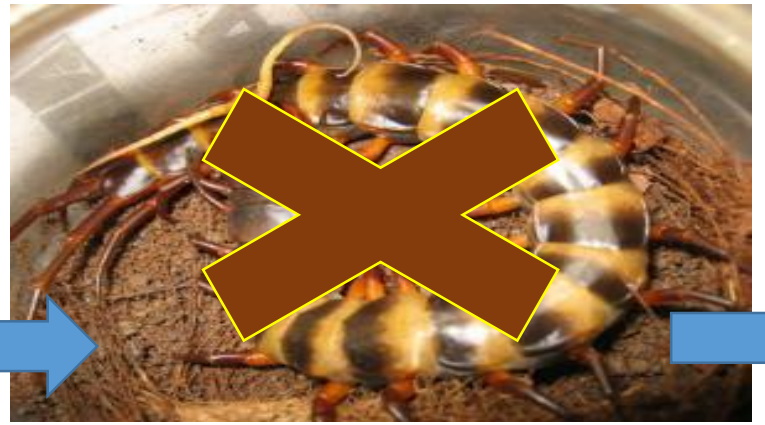


Phetchaburi

Hidden diversity of genus *Scolopendra*

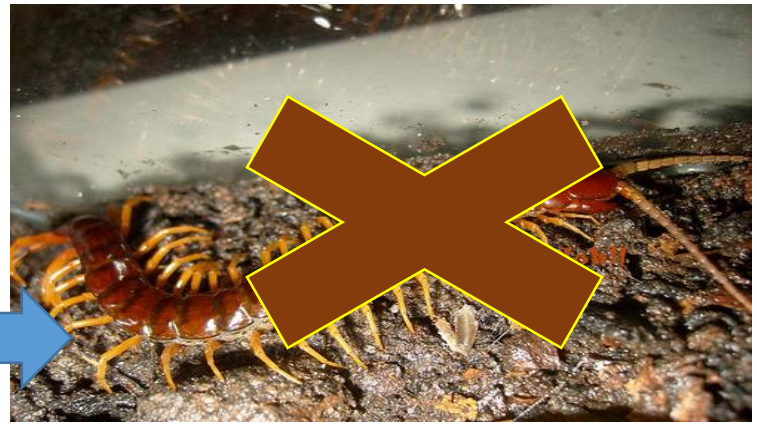
Morphology and molecular revision of cosmopolitan species (*Scolopendra subspinipes* Leach, 1816)

S. subspinipes



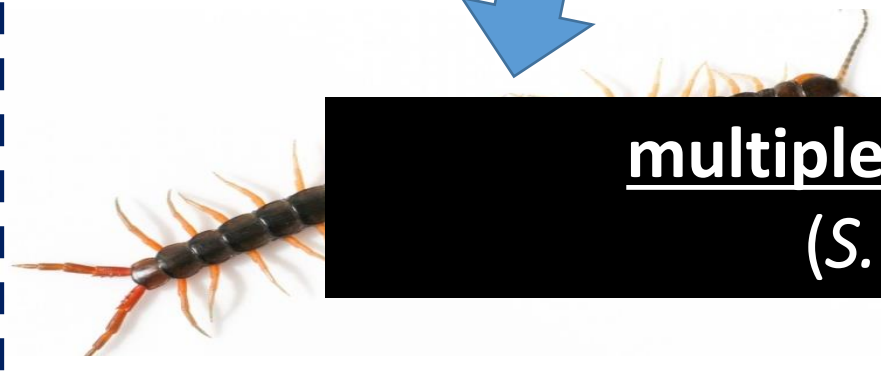
S. subspinipes piceoflava

syn. nov.



S. subspinipes fulgurans

syn. nov.



S. japonica

S. dehaani

S. dawydoffi

<u>multiple species</u> are hidden under single name (*S. subspinipes;* widespread species)

Picture references : http://terrartropoda.wordpress.com/2013/11/13/ficha-ciempies-gigante-scolopendra-subspinipes/

Phylogenetic tree
(1st phase)

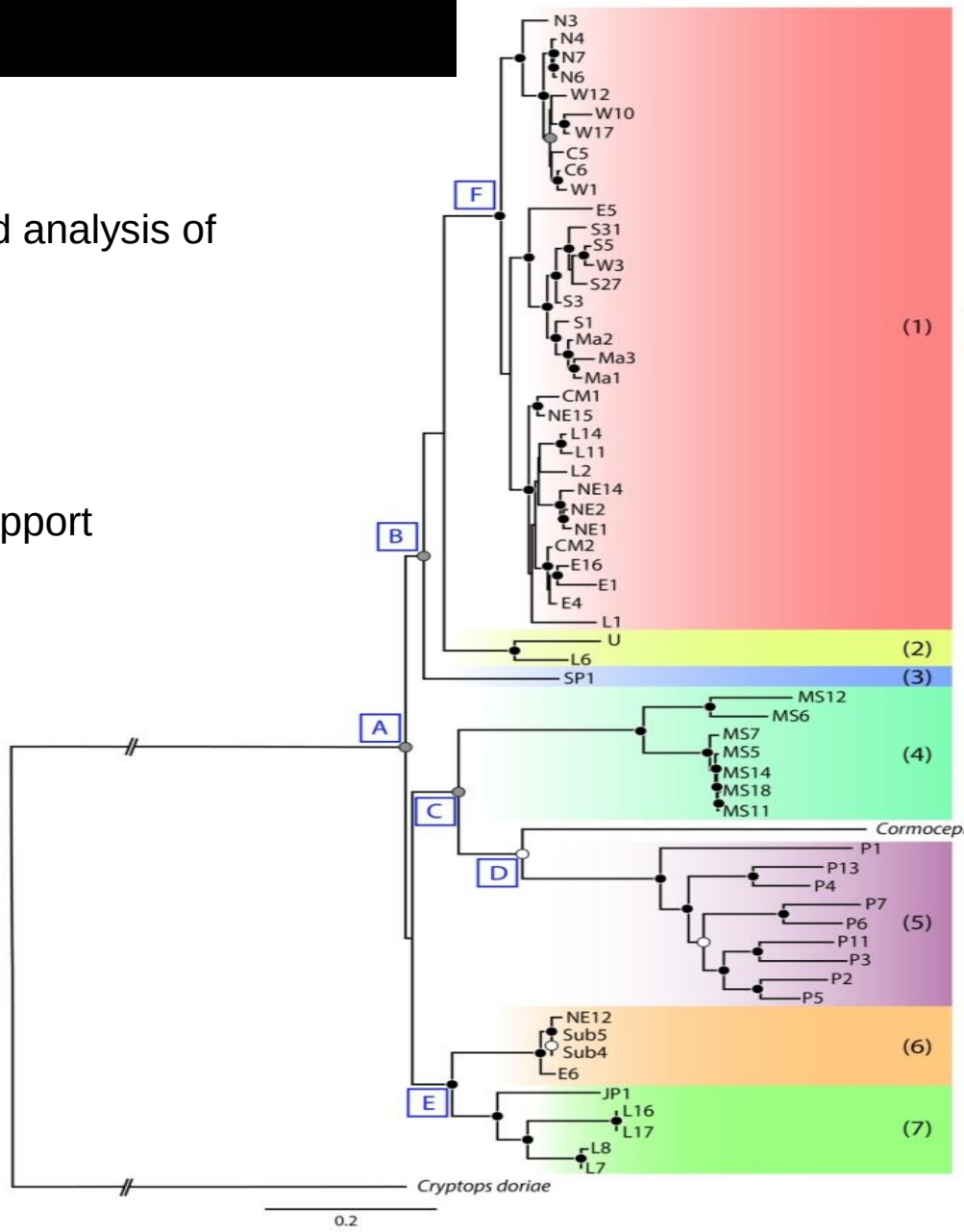
- Random sample
- Concatenated genes and partitioned analysis of 16S, COI and 28S sequences

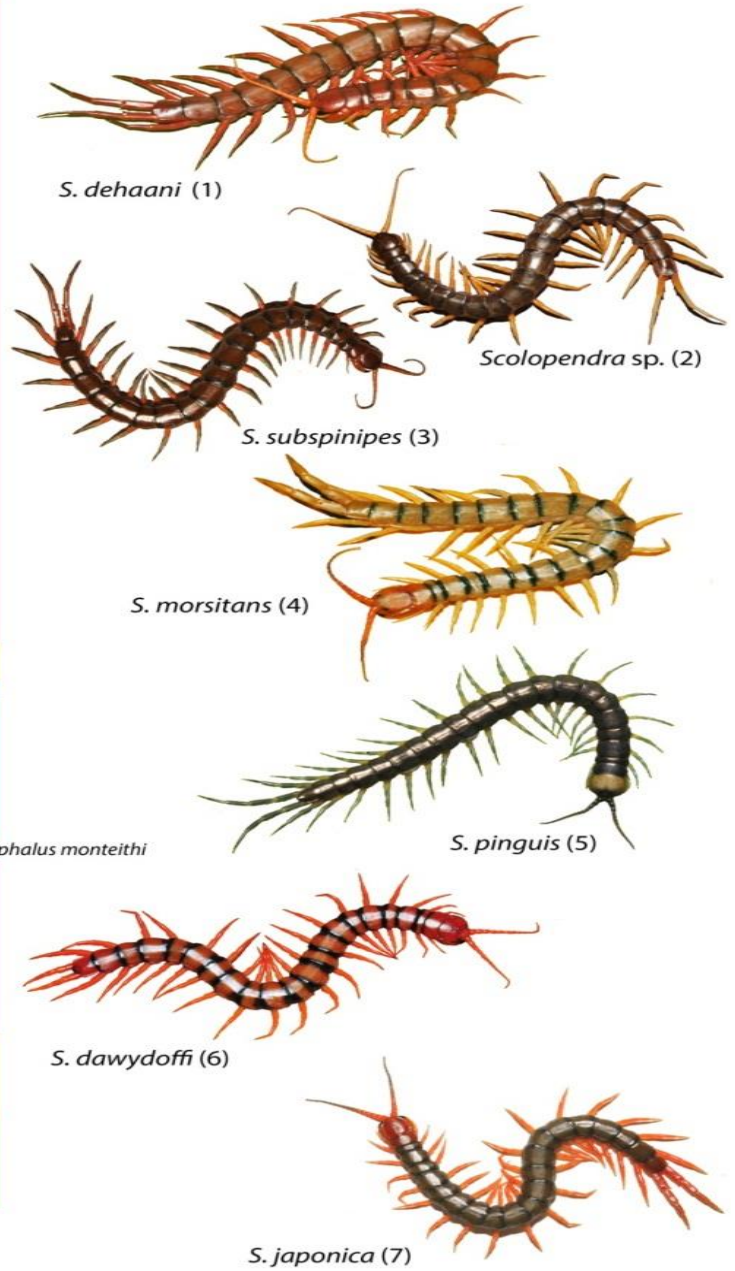
- 7 *Scolopendra* clades
  - ❑ 6 nominate species
  - ❑ 1 putative species but weak support value

Genetic distance

COI:15-19.9%

16S:10.6-22.4%



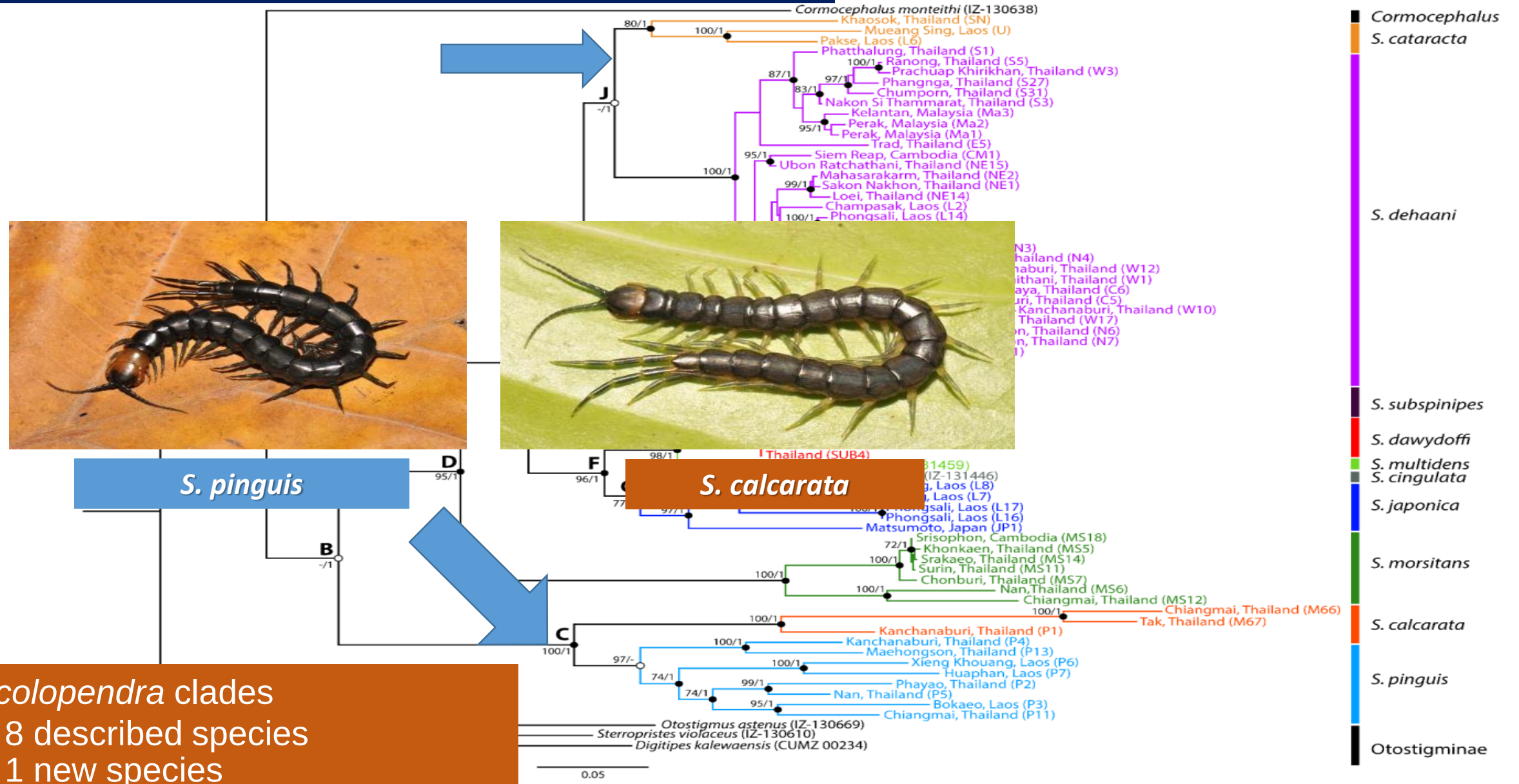


Phylogenetic tree
(2nd phase)

16S, COI and 28S genes

S. pinguis

S. calcarata



- 9 *Scolopendra* clades
  - ❑ 8 described species
  - ❑ <u>1 new species</u>

| WEIRD & WILD |

'Horrific' First Amphibious Centipede Discovered

NATIONAL GEOGRAPHIC

This giant, venomous creepy-crawly is as comfortable swimming and walking underwater as it is on land, in a finding that surprised scientists.

Meet *S. cataracta*, a new spe
the group.
PHOTOGRAPH BY WARUT

The International Institute for Species Exploration at the College of Environmental Science and Forestry and the International Top 10 Selection Committee Honor the Scientific Achievement of

Gregory D. Edgecombe • Somsak Panha • Warut Siriwut
Chirasak Sutcharit • Piyoros Tongkerd

For the Discovery of the Remarkable New Species

Scolopendra cataracta

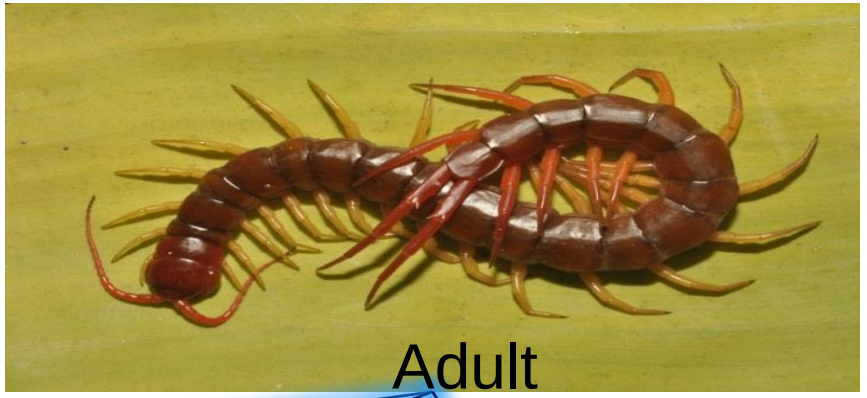
May 23, 2017

Quentin Wheeler, Ph.D.
President, College of Environmental Science and Forestry
Director, International Institute for Species Exploration

Antonio Valdecasas
Museo Nacional de Ciencias Naturales in Madrid, Spain
Chair, International Institute for Species Exploration

Colouration pattern

Development/growth

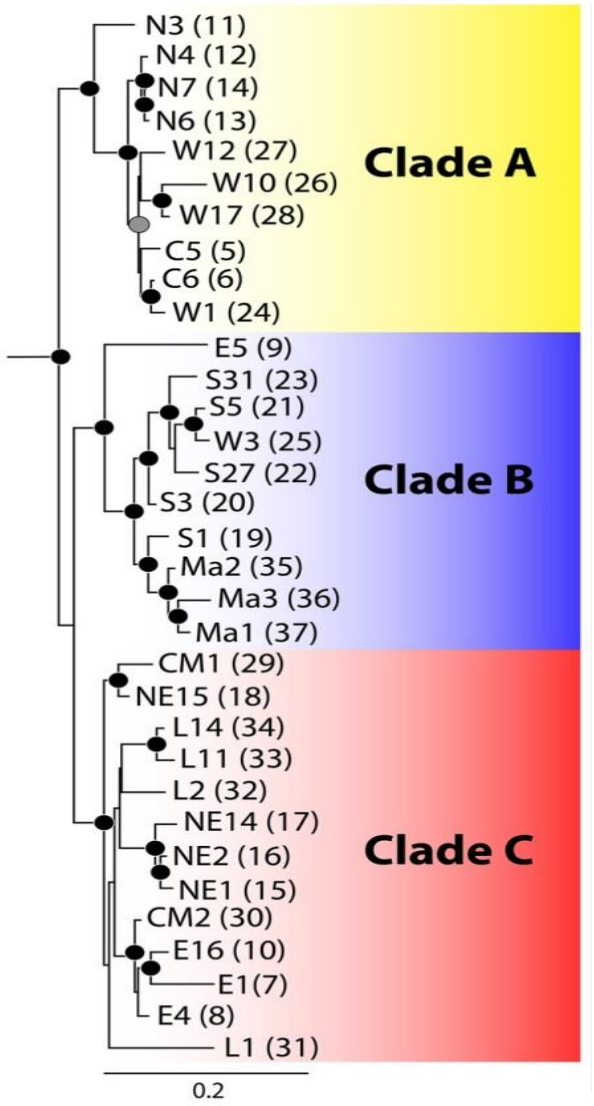


Populations

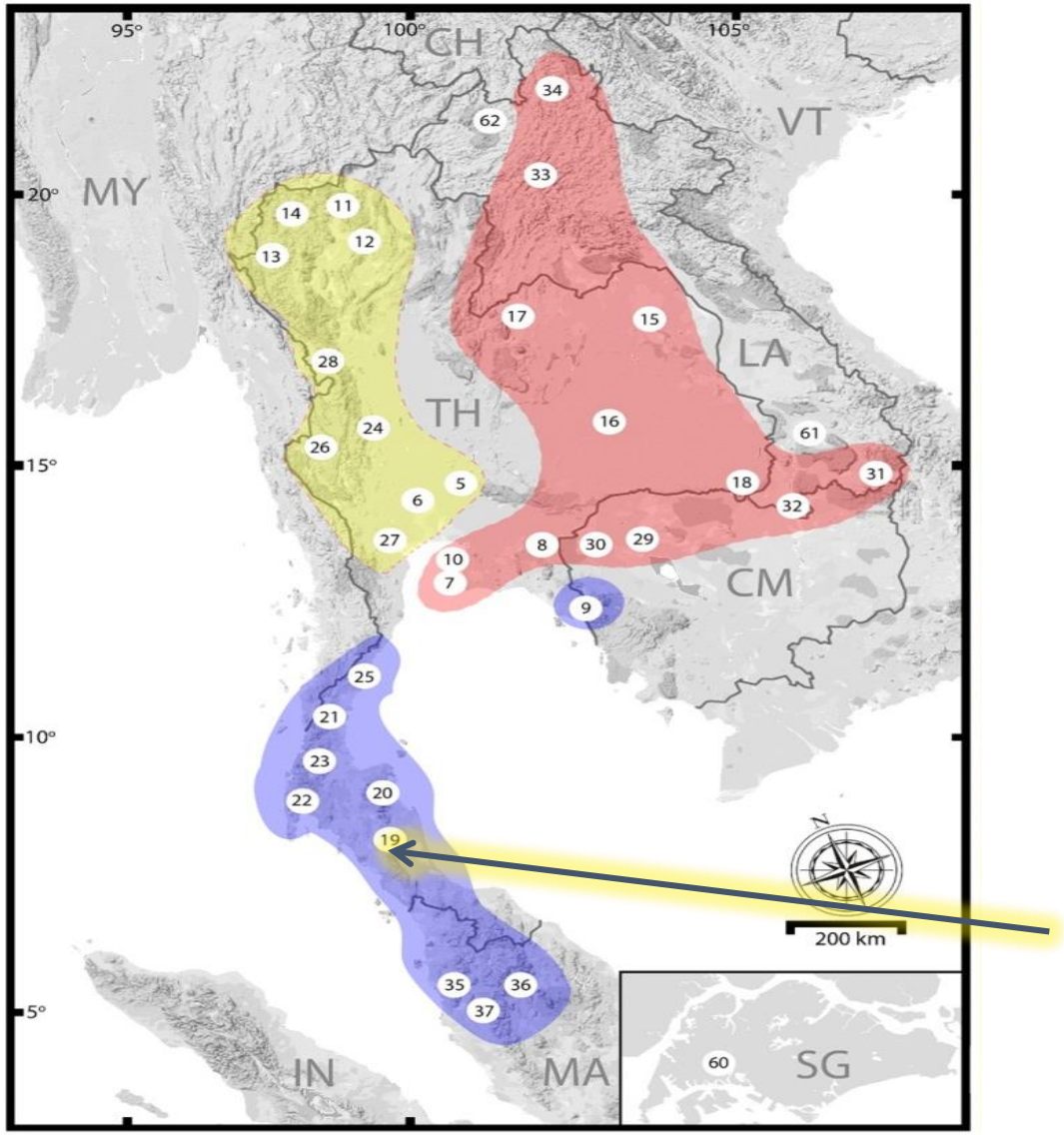
Genetic structure of Scolopendra dehaani populations Siriwut et al. (2016)

PLOS ONE

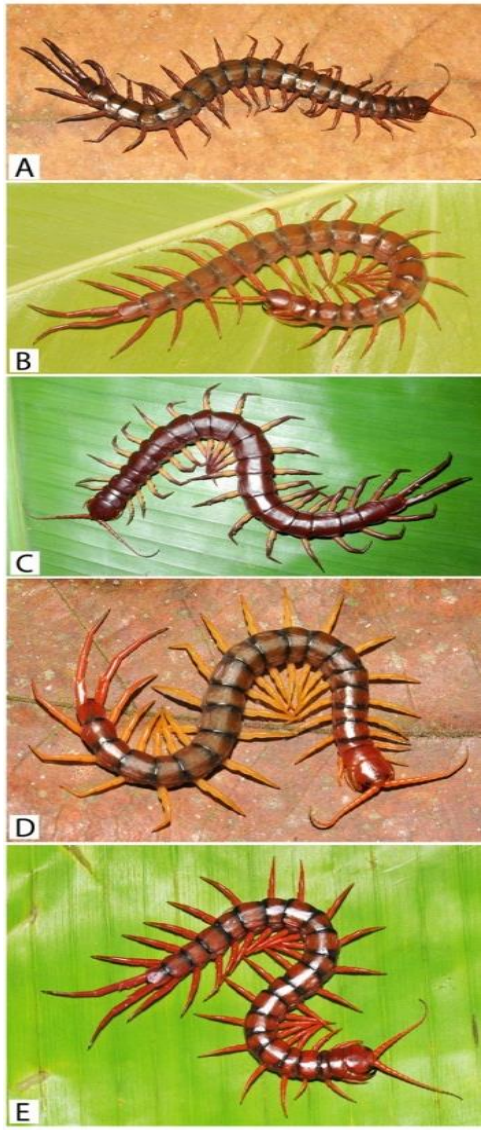
Phylogenetic tree



Sampling map



Colouration patterns



Millipede-like centipede (with coiling behaviour; to defense)

© Kurt 2015
orionmystery.blogspot.com

To end users

Advantages and limitations of DNA Barcoding in identifying Commercially-Exploited Fish Species

……but is totally in efficient when is dealing with hybrids and should be avoided for species that can naturally hybridize.

Dudu A. et al./Scientific Papers
Animal Science and Biotechnologies, 2016, 49 (1)

The problems and promise of DNA barcodes for species diagnosis of primate biomaterials.

- The QC process is complicated by taxon specific patterns of ‘ universal primer’ failure…….
- Taxon specific primers has been developed.

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B
Phil. Trans. R. Soc. B (2005) **360**, 1869–1878
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Suggestion

Verification

- Voucher specimens: critical investigate, re-investigate
- Field works concentration
- Descriptions, re-descriptions
- Publish
- Co-operating molecular team….an inevitable
- There are still amazed organisms to be discovered…