Code names for putative new Australian animal species – a proposal for a national framework

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Australian biota

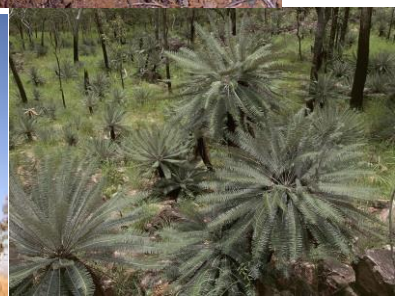
- Mega-diverse
- Mostly poorly known







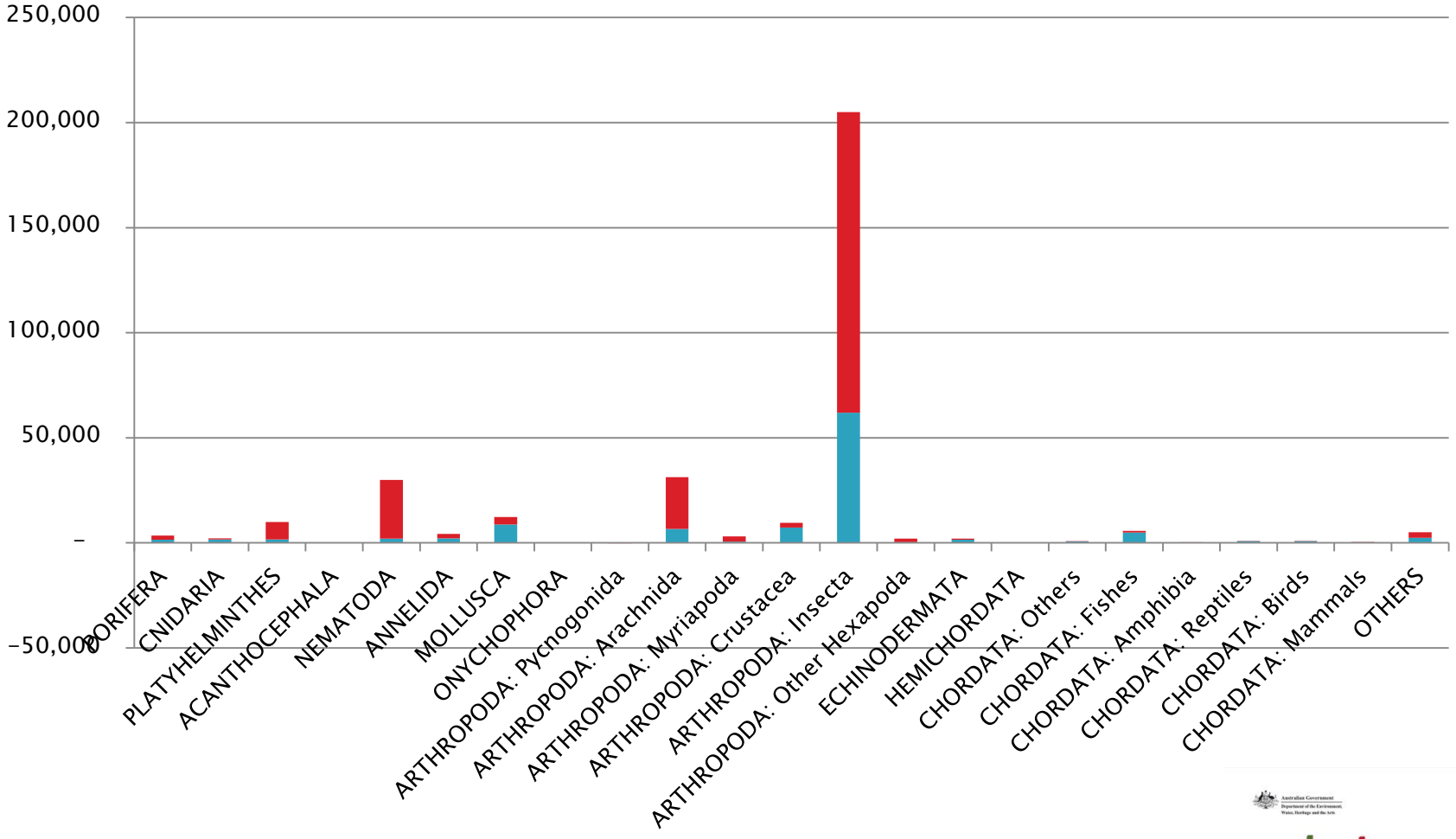




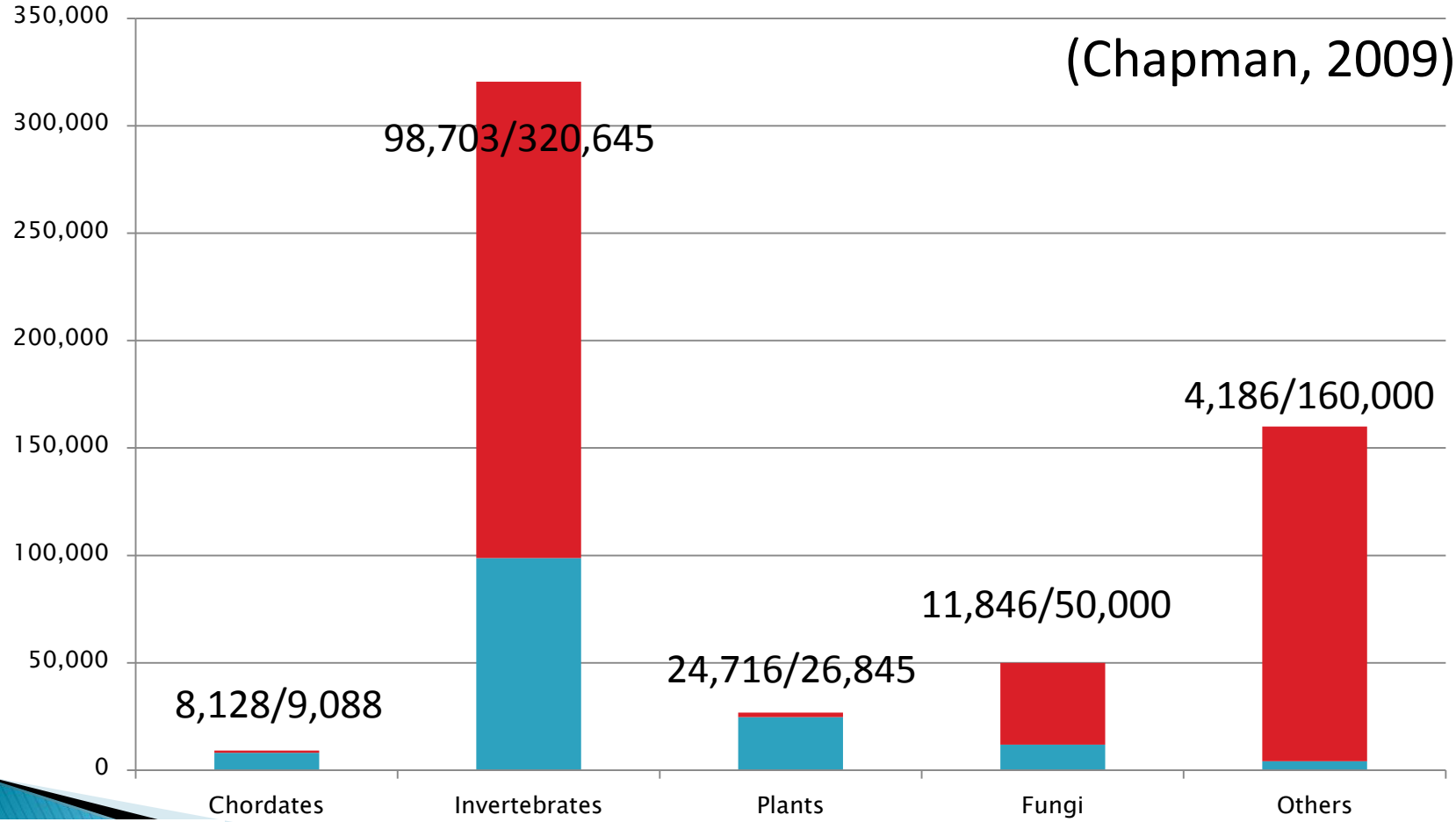


Taxonomic impediment (Taylor, 1983)



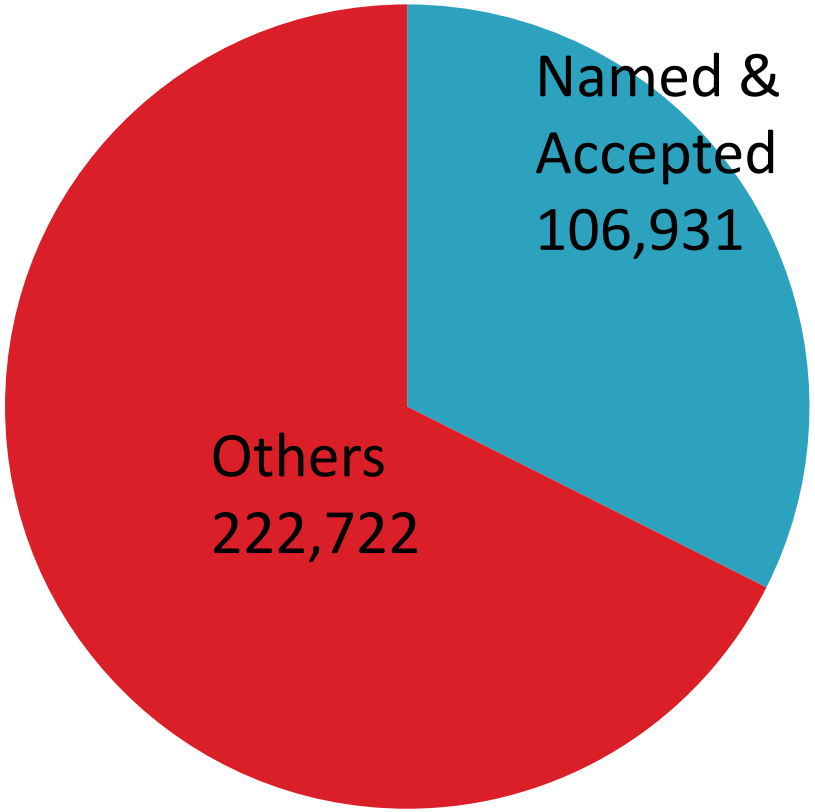
(Chapman, 2009)

Many major groups with 100s to 1000s of new species



Australian fauna

Others includes new species, or species not previously recorded from Australia



(Chapman, 2009)

Also…..

- Many new genera….
- Several lifetime's work to name entire fauna

Communication

- Taxonomists' knowledge is rarely captured in museum databases
- Some taxonomists use informal coding systems, or manuscript names
  - e.g. "sp. nov. 1"; "sp. nov. Stirling Range"; "sp. nov. black legs"; "*fuscipes*"
- Fine for small-scale surveys, but not appropriate otherwise

Council of Heads of Australian Herbaria

- Problems with standardising names, especially across state/territory boundaries

- "Standardising informal names in Australian publications"
  - Barker (2005), *Australian Systematic Botany Society Newsletter* **122**: 11–12.

WA Herbaria

- Proposed solution:

- *Genus-name sp. Phrasename (Voucherspecimen*
- *identifier)* Source

- *Pterostylis sp. Sandheath (D.Murfet 3190)* R.J.Bates

WA Museum Arachnology solution

- In response to needs of industry & government
- System devised by Volker Framenau
- Alphanumeric code system:
  - Species: ‘AAA111’
  - = 17,756,000 unique combinations
- Each code is linked to a registered voucher specimen

The code system

- Putative new species
  - *Aname* ‘MYG004’
- Putative new genera
  - ‘PSEAAA’ (the first new pseudoscorpion genus that we recognised)
- Can deal with changing generic concepts
  - e.g. *Aname* ‘MYG123’ later recognised as *Kwonkan* ‘MYG123’

Phylum Arthropoda

Subphylum Chelicerata	
Class Arachnida	
Order Acari	ACA
Order Amblypygi	AMB
Order Araneae	ARA & MYG
Order Opiliones	OPI
Order Palpigradi	PAL
Order Pseudoscorpiones	PSE
Order Schizomida	SCH
Order Scorpiones	SCO
Subphylum Myriapoda	
Class Chilopoda	CHI
Class Diplopoda	DIP
Class Pauropoda	PAU
Class Symphyla	SYM

93 codes to rule them all

- Code names based on:
  - Size of the taxon
  - Number of active taxonomists per group
  - e.g., no need to give a code for each order

- First three letters of higher taxon name:
  - Only six duplicates!

1 Code per Phylum (26)

PORIFERA	POR	3,500
CNIDARIA	CNI	2,200
CTENOPHORA	CTE	60
DICYEMIDA	DIC	?
NEMERTEA	NER	281
XENACOELOMORPHA	XEN	?
GASTROTRICHA	GST	45
ROTIFERA	ROT	1,300
CHAETOGNATHA	CHA	10
ACANTHOCEPHALA	ACN	160
KINORHYNCHA	KIN	8
GNATHOSTOMULIDA	GNA	6
LORICIFERA	LOR	6
NEMATODA	NEM	30,000
NEMATOMORPHA	NET	32
BRYOZOA	BRY	2,500
BRACHIOPODA	BRA	70
PHORONIDA	PHO	6
PRIAPULIDA	PRI	2
SIPUNCULA	SIP	48
ECHIURA	ECI	13
KAMPTOZOA	KAM	>16
ONYCHOPHORA	ONY	80
TARDIGRADA	TAR	500
ECHINODERMATA	ECH	2,000
HEMICHORDATA	HMI	22

Classification from ABRS Australian Faunal Directory

Species numbers from Chapman (2009)

WESTERN AUSTRALIAN museum

>1 Code per Phylum (11)

PLATYHELMINTHES	"Turbellaria"	TUR	
	Cestoda	CES	
	Trematoda	TRE	10,000
	Monogenea	MON	
MOLLUSCA	Aplacophora	APA	
	Bivalvia	BIV	
	Polyplacophora	PLY	
	Scaphopoda	SCA	12,250
	Cephalopoda	CEP	
	Gastropoda	GAS	
ANNELIDA	Polychaeta	POL	
	Pogonophora	POG	4,230
	Oligochaeta	OLI	
	Hirudinida	HIR	
CHORDATA	Tunicata	TUN	850
	Cephalochordata	CPH	8
	"Pisces"	PIS	5,750
	Amphibia	AMB	230
	"Reptilia"	REP	950
	Aves	AVE	900
	Mammalia	MAM	390

>1 Code per Phylum (46)

Pycnogonida		PYC	?
Arachnida	Acari	ACA	20,000
	Amblypygi	AML	10
	Araneae	ARA	10,000
	Opiliones	OPI	500
	Palpigradi	PAL	3
	Pseudoscorpiones	PSE	600
	Schizomida	SCH	75
	Scorpiones	SCO	150
Chilopoda		CHI	446
Diplopoda		DPL	2,000
Pauropoda		PAU	500
Symphyla		SYM	150
Branchiopoda		BRN	
Ostracoda		OST	
Remipedia		REM	9,500
Maxillipoda		MAX	
Malacostraca		MAL	

Entognatha	Diplura	DIL	38
	Protura	PRO	32
	Collembola	CLL	2,000
Insecta	Archaeognatha	ARC	14
	Thysanura	THS	38
	Odonata	ODO	330
	Phasmida	PHA	150
	Mantodea	MAN	160
	Ephemeroptera	EPH	333
	Plecoptera	PLE	196
	Blattodea	BLA	1,042
	Embioptera	EMB	28
	Orthoptera	ORT	2,800
	Dermaptera	DER	121
	Zoraptera	ZOR	1
	Psocodea	PSO	1,000
	Thysanoptera	THY	1,500
	Hemiptera	HEM	11,580
	Neuroptera	NEU	800
	Megaloptera	MEG	26
	Coleoptera	COL	80,000–100,000
	Strepsiptera	STR	159
	Diptera	DIP	30,000
	Mecoptera	MEC	30
	Siphonaptera	SPH	92
	Trichoptera	TRI	800
	Lepidoptera	LEP	20,000
	Hymenoptera	HYM	44,000

Uses & uptake

- WAM have nominated taxa to the WA Threatened Species Scientific Committee

- WAM have published peer-reviewed papers using these codes, including barcoding paper

WAMinals – species identification

http://www.museum.wa.gov.au/catalogues/waminals/about-waminals

2. **Browse available genera using the taxon browser featured below:**

Draculoides

Modifications

- Putative new taxa have since been “synonymised”, either with named species, or with other coded species
  - especially using DNA data

Requirements

- National database, with links to museum databases, e.g.
  - Atlas of Living Australia
  - Australian Biological Resources Study
  - OZCAM

Good points

- Allows precise communication between taxonomists, government and industry
- Based on vouchered museum specimens
- Taxonomists can decide which taxa to release to ALA & OZCAM

Bad points

- Requires maintenance by specialists of a national register
  - which might be impossible for some groups….
- Advertises putative new species
  - Danger of taxonomic ‘vandalism’
  - Implement standard ALA/OZCAM safeguards for at-risk taxa
- Unwieldy for large groups (e.g. over 10,000 species)
- Current system only caters for 1,000 species per Code

Can it work?

- I don’t know – I doubt it
- Only if the community thinks it’s worthwhile
- Only if specialists are willing to take on the coordinating role

Acknowledgements

- Volker Framenau (now Phoenix Environmental Sciences)
- Discussions with WAM staff