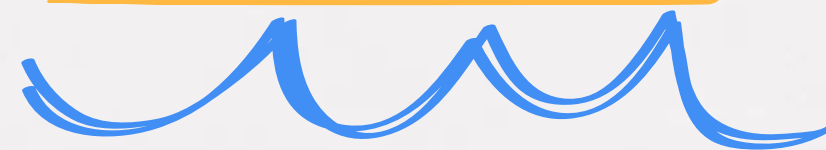




How do lineage delimitation
and biogeography help us
understand the evolution of

Chondrichthyes?



Flávia F. Petean, Ph.D.

CONICET Postdoctoral Fellow



UNIVERSIDAD
NACIONAL DE
SAN MARTÍN

I I B - I N T E C H

Why study Biogeography?



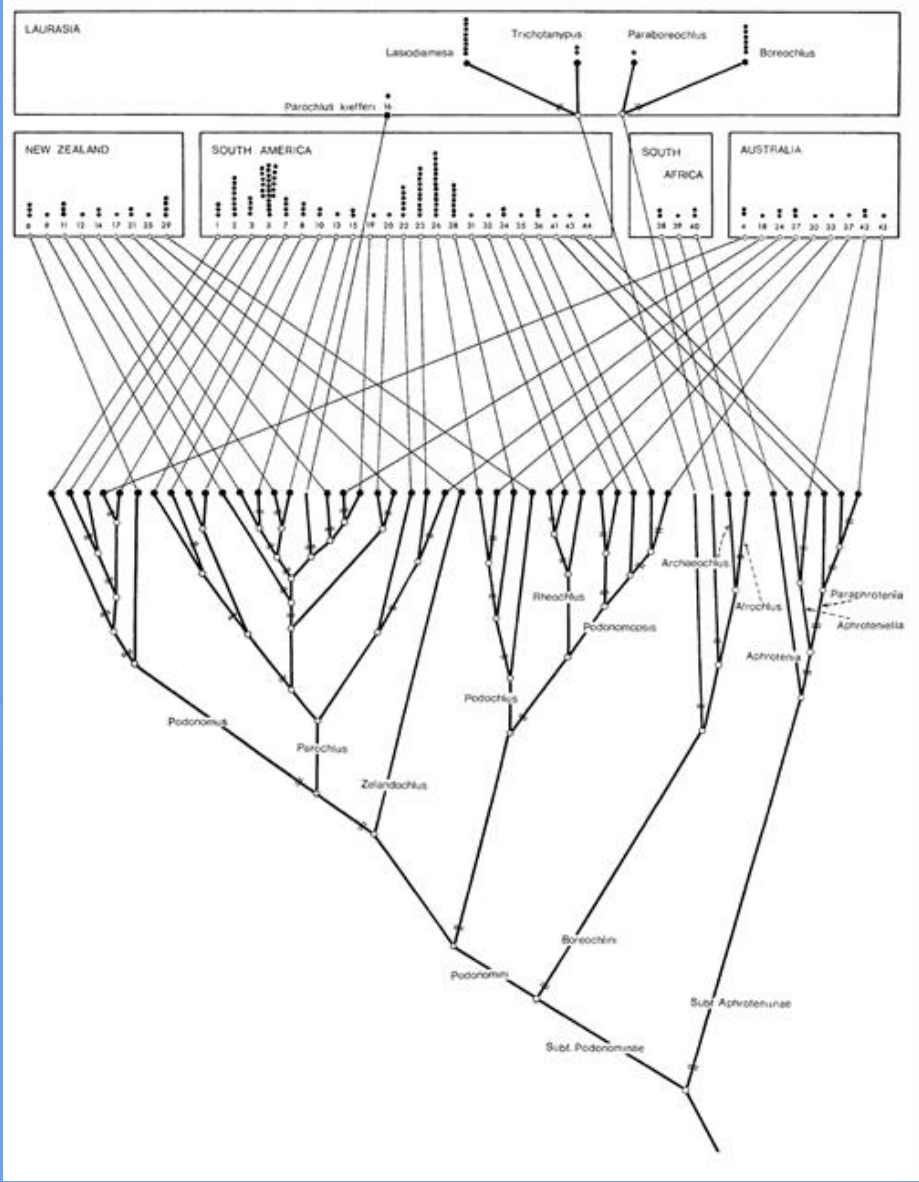
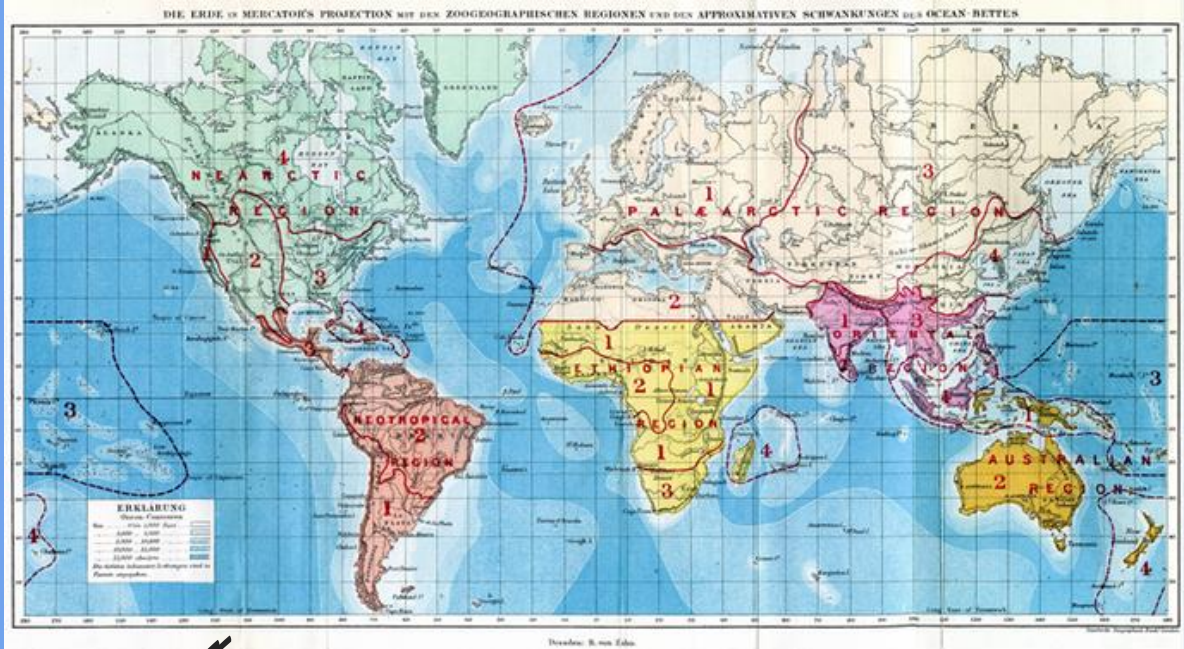
- Understanding the spatial patterns of biodiversity
- Explain the processes
- Providing information for conservation

BUT

- No experimentation
- Theories change over time with more data and analysis

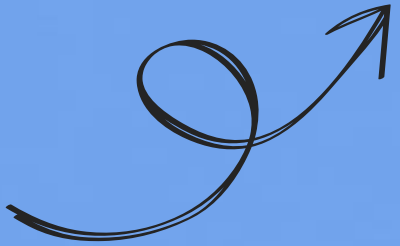
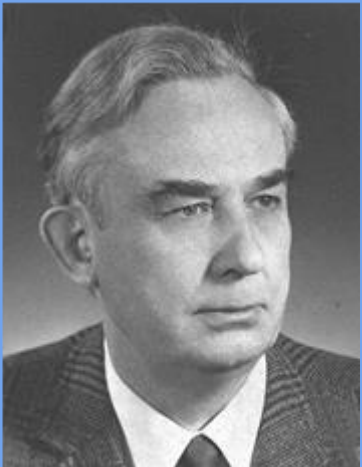
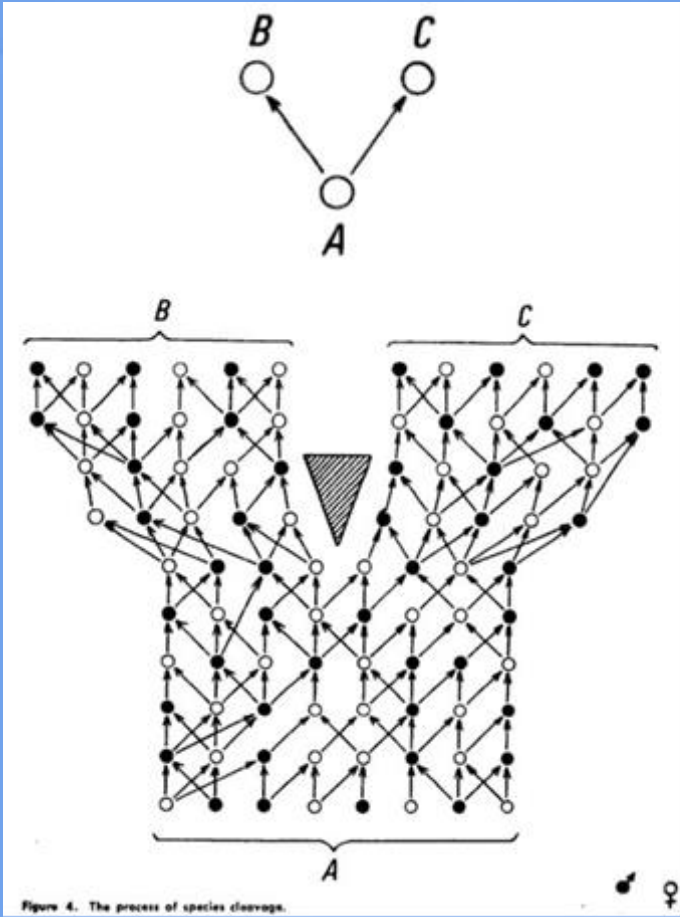


Historical biogeography



I think

There is a line between A & B. various
size of relation. C & B. The
first predation, B & D
rather greater distance
than genus would be
formed. - binary relation



Darwin, 1859

Wallace, 1876

Hennig, 1966

Brundin, 1965

Arbogast & Kenagy, 2001

Funk, 2004

Bowen et al., 2016

Women in Biogeography



Mary Anning
1799 – 1847



Marie Tharp
1920 – 2006

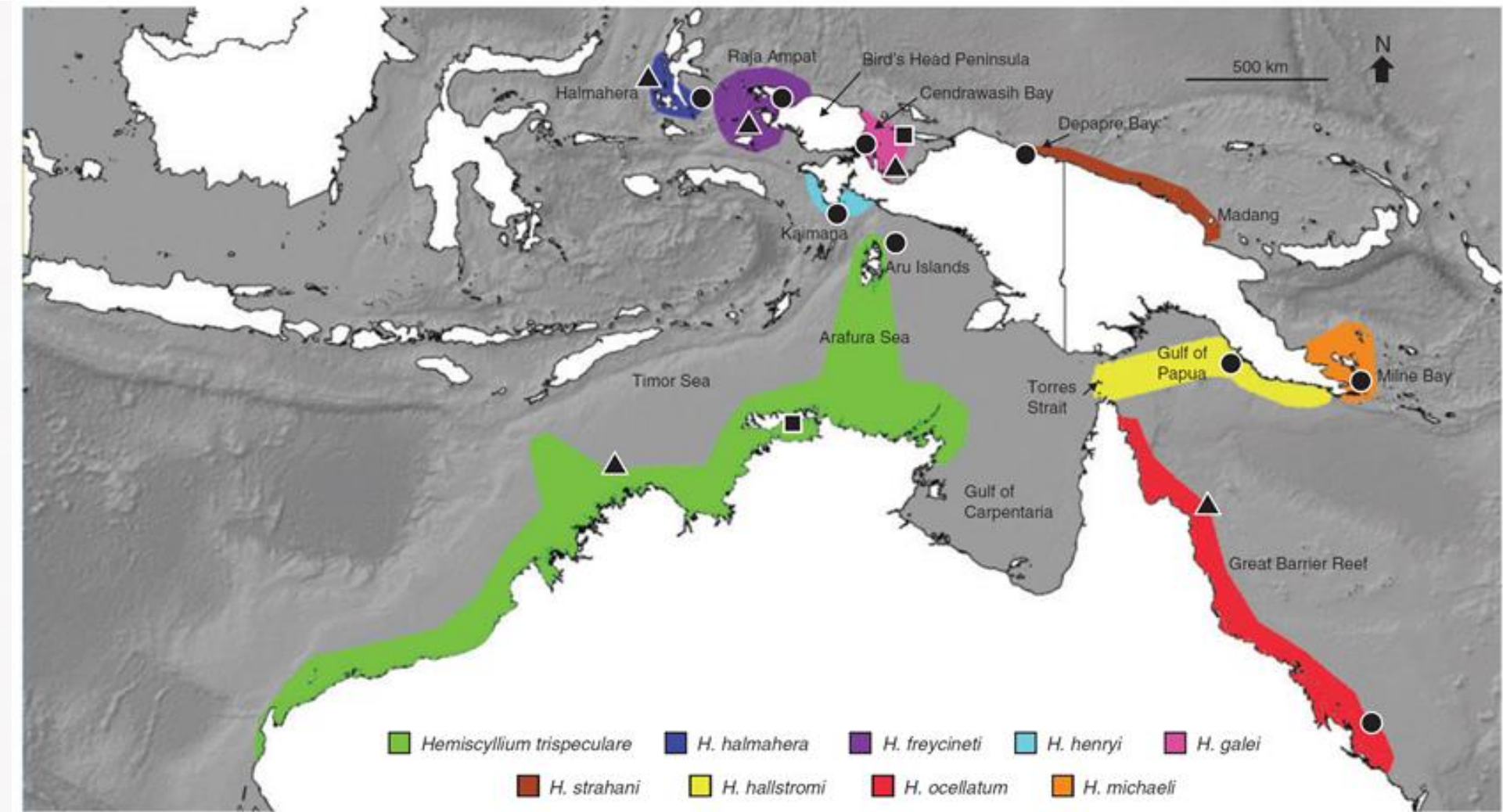
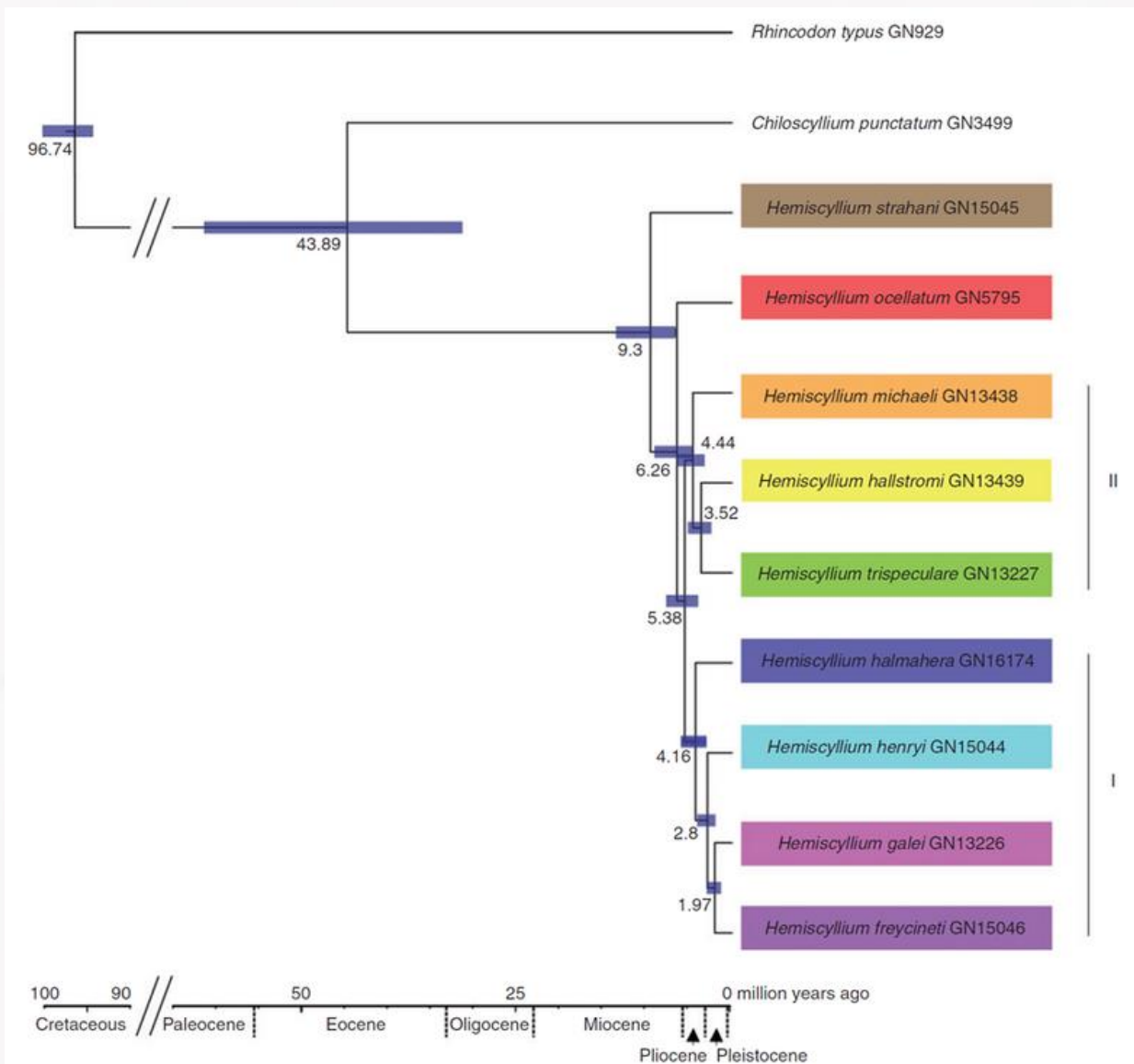


Vicky Funk
1947 – 2019



Shannon Corrigan
Florida Museum of
Natural History

Hemiscyllium



Dispersion + Founding Event



Ecology



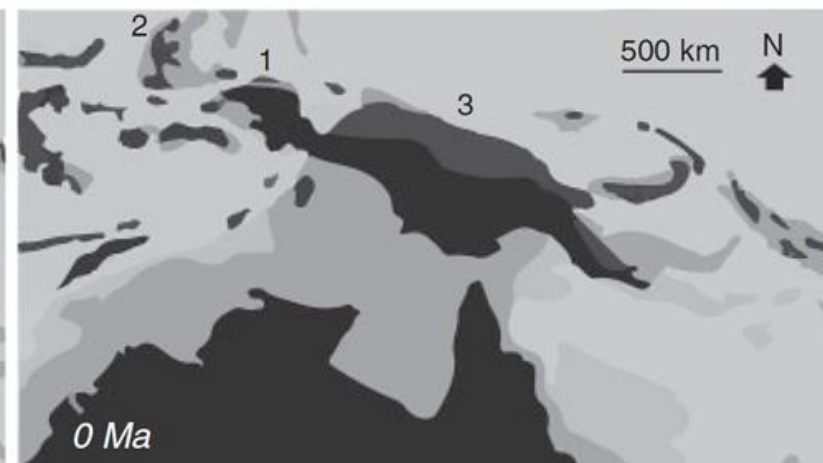
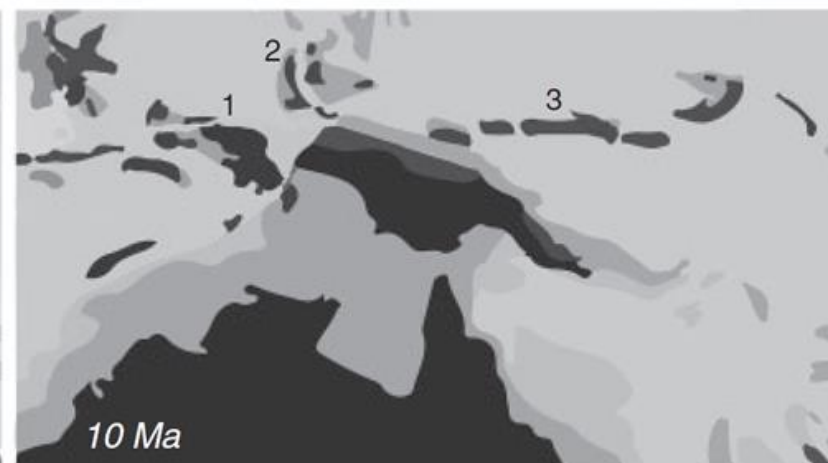
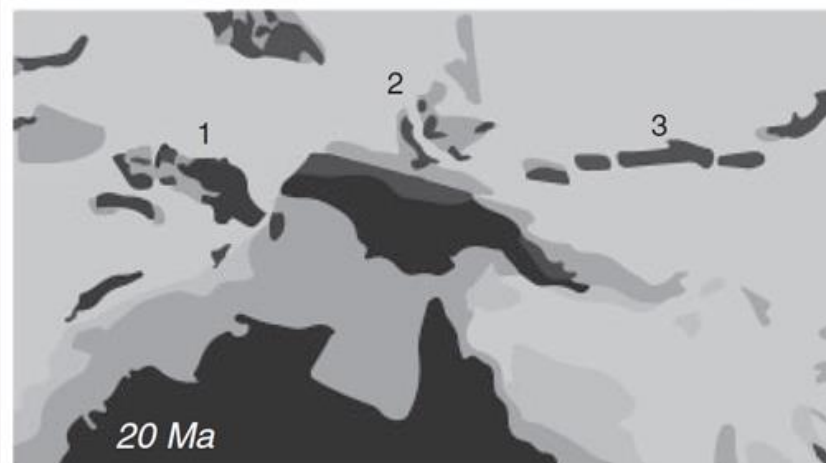
Vicariance



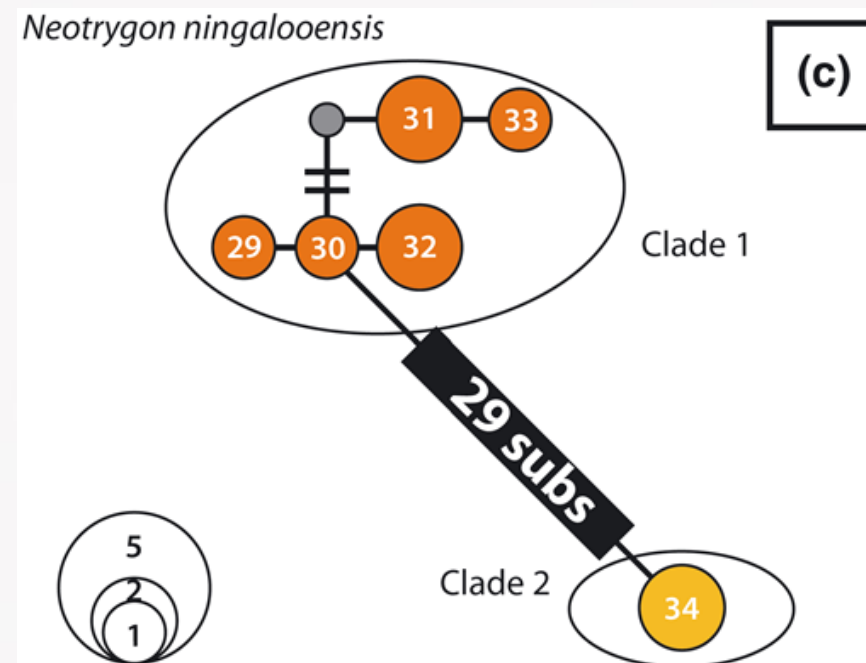
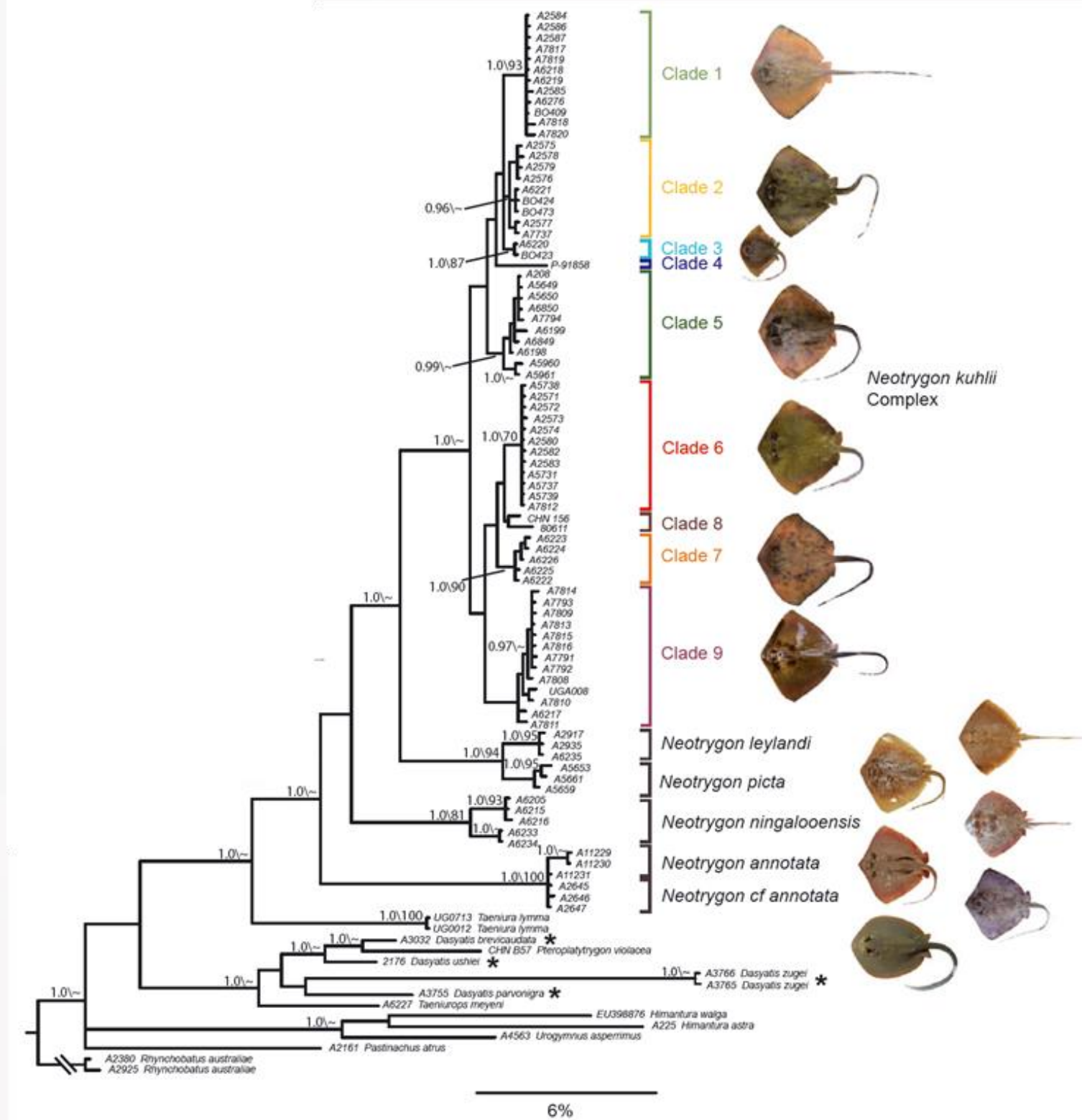
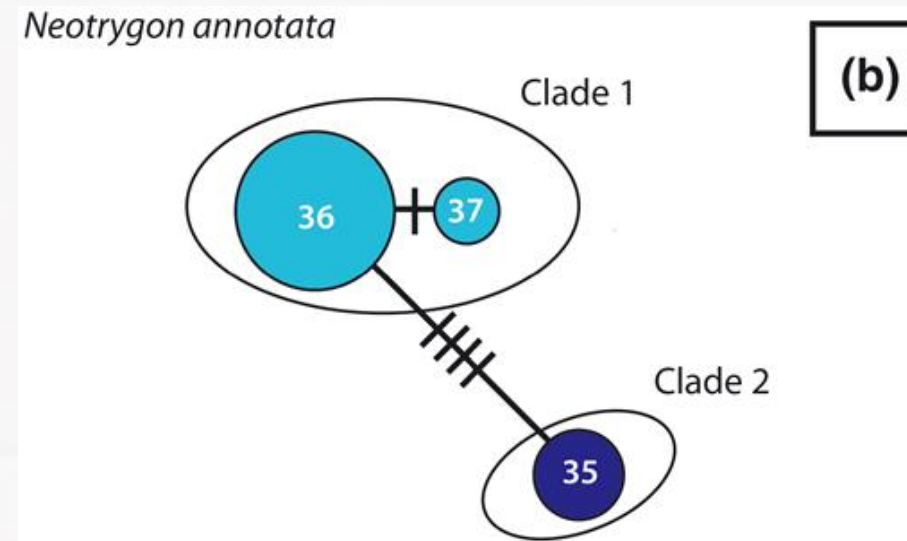
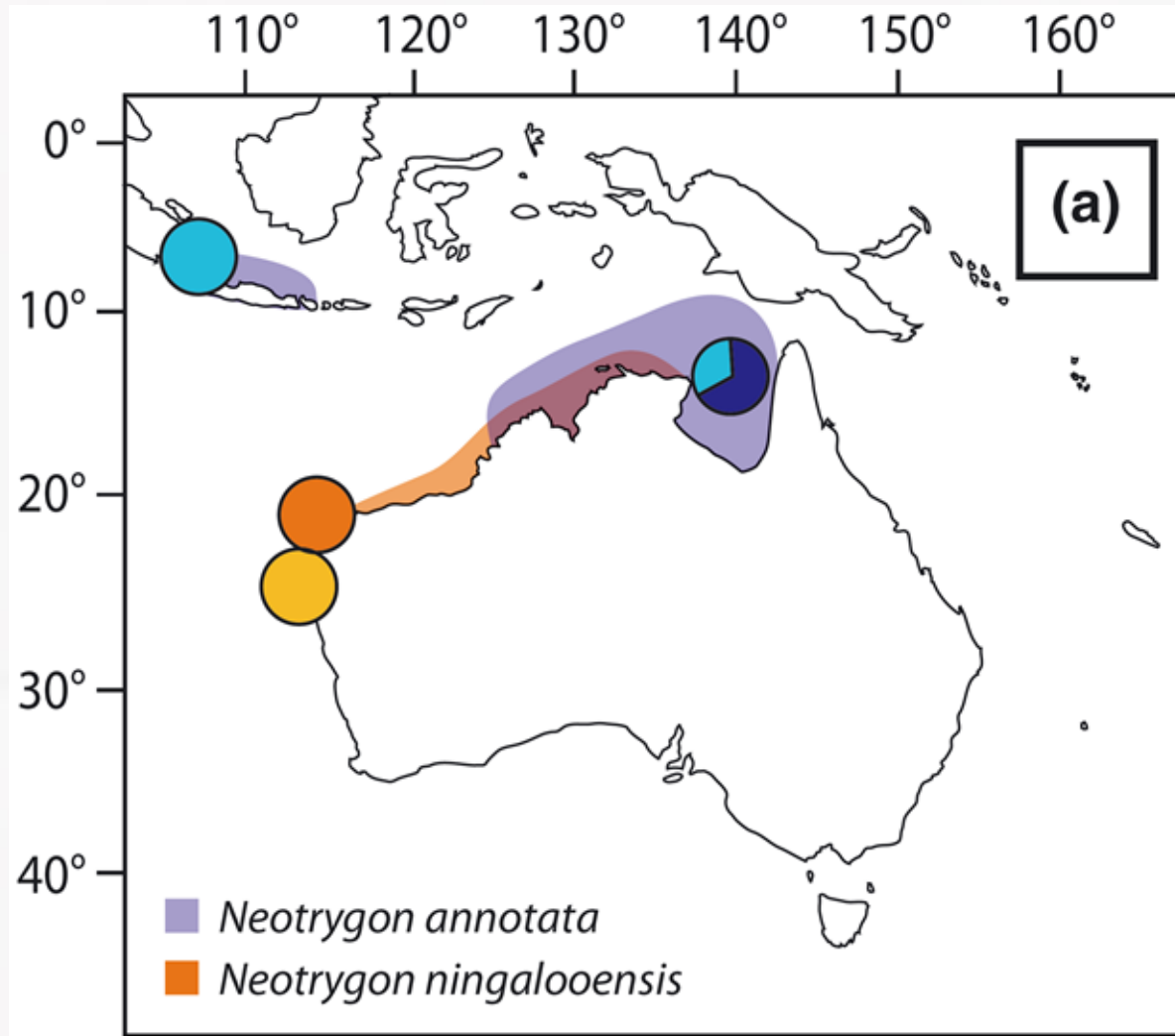
Secondary contact?



mitogenome + ND4



Neotrygon



Isolation by distance?



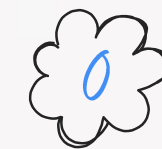
Tectonic rafting?



COI + 16S + RAG1



N. ningalooensis



N. annotata

Why delimit lineages?



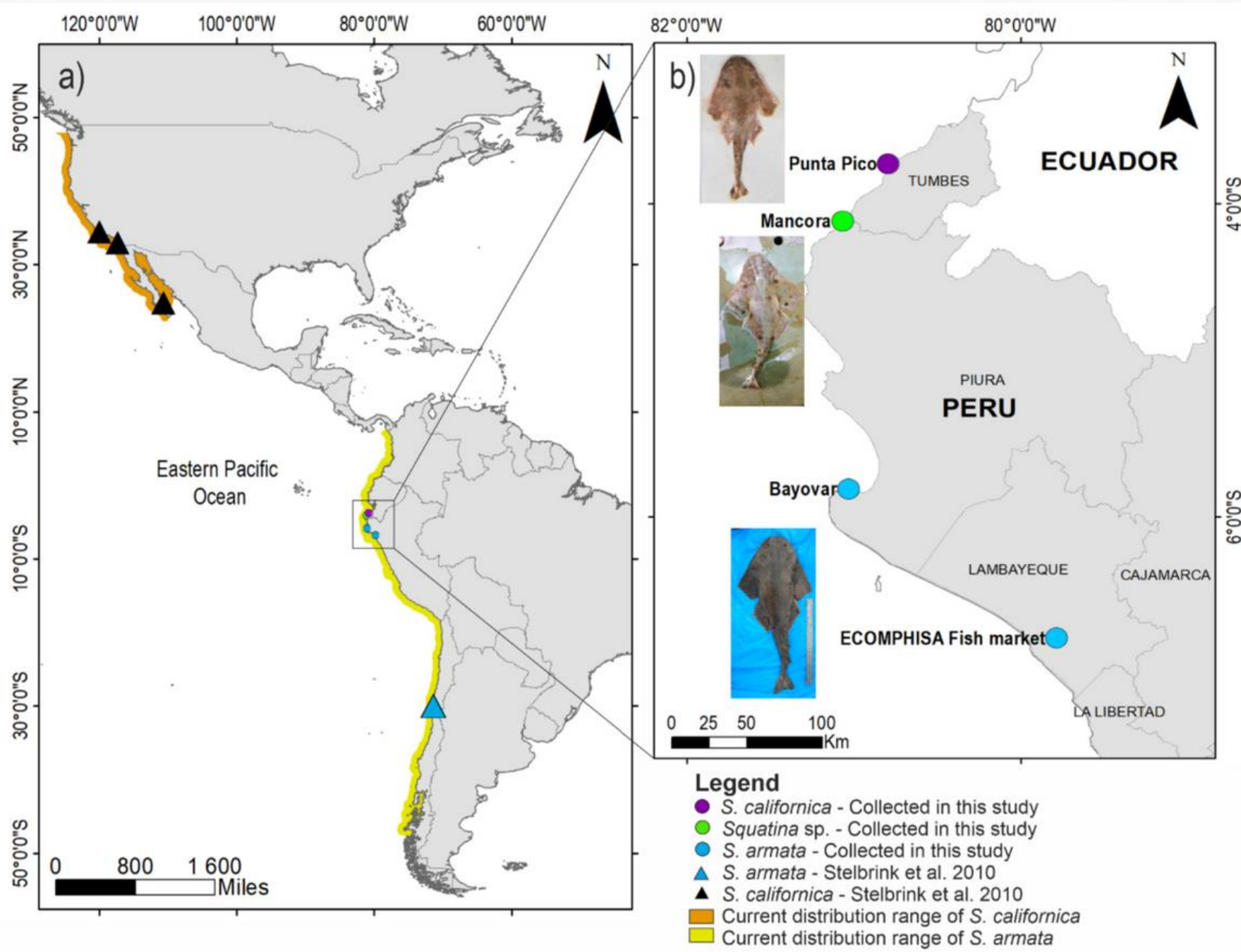
- Identify cryptic species – that do not differ morphologically
- Understand Evolutionary Processes
- Separate species for appropriate conservation measures

BUT

- How much data is enough?
- What about morphology?
- And other information?



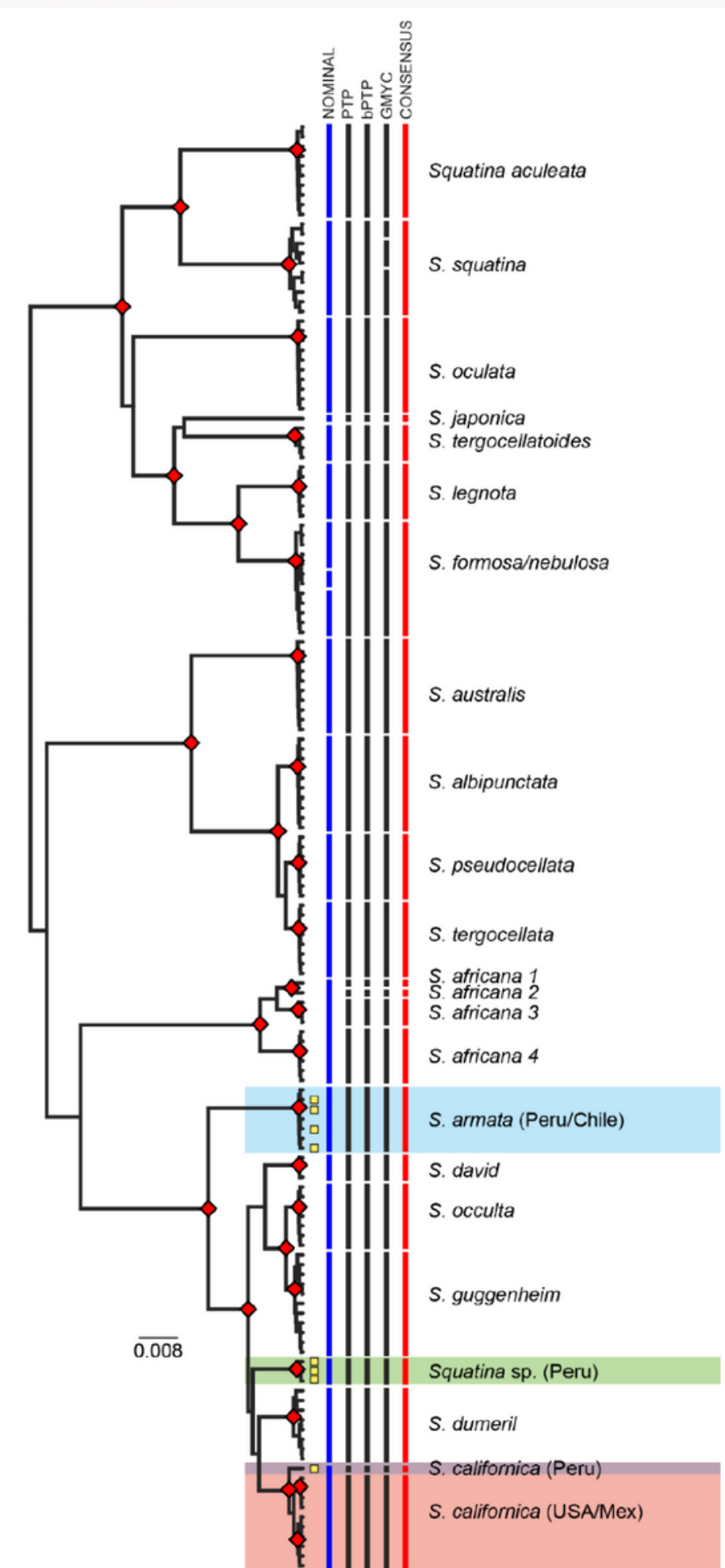
Squatina



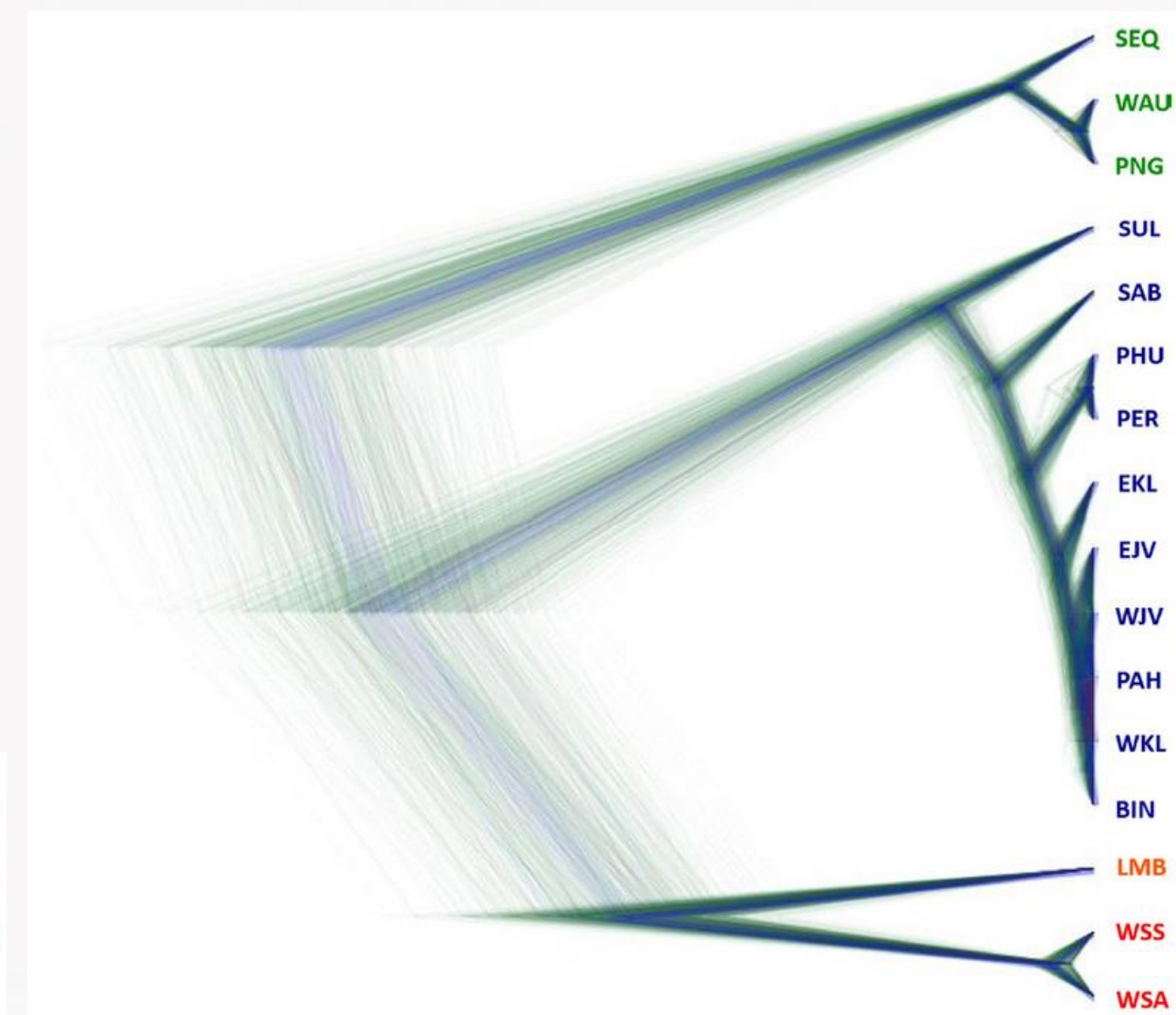
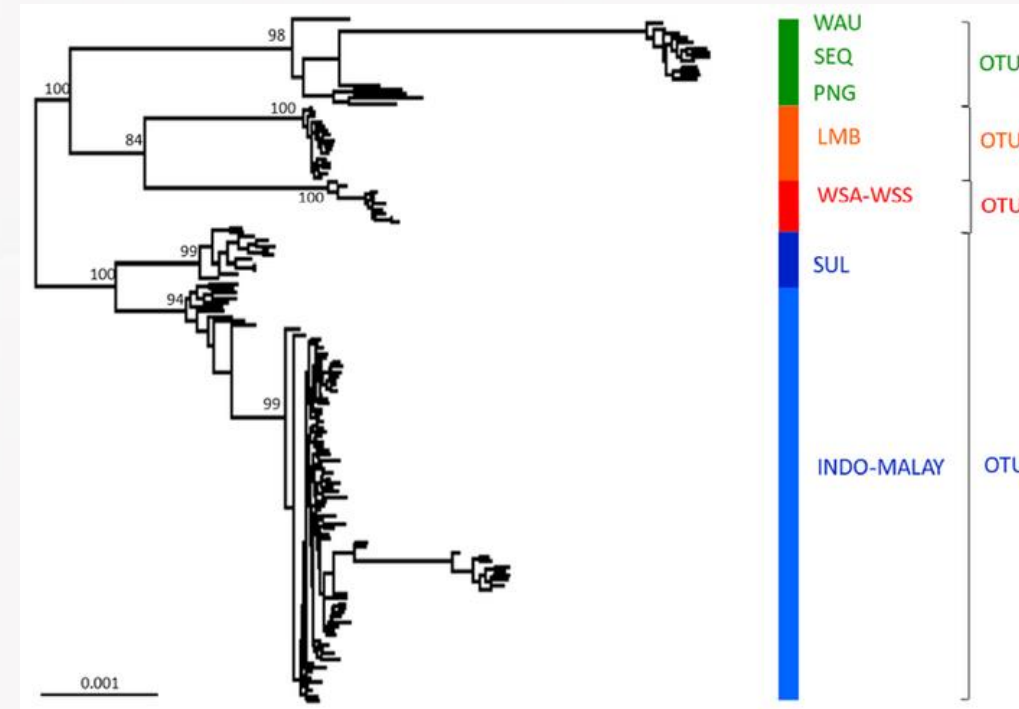
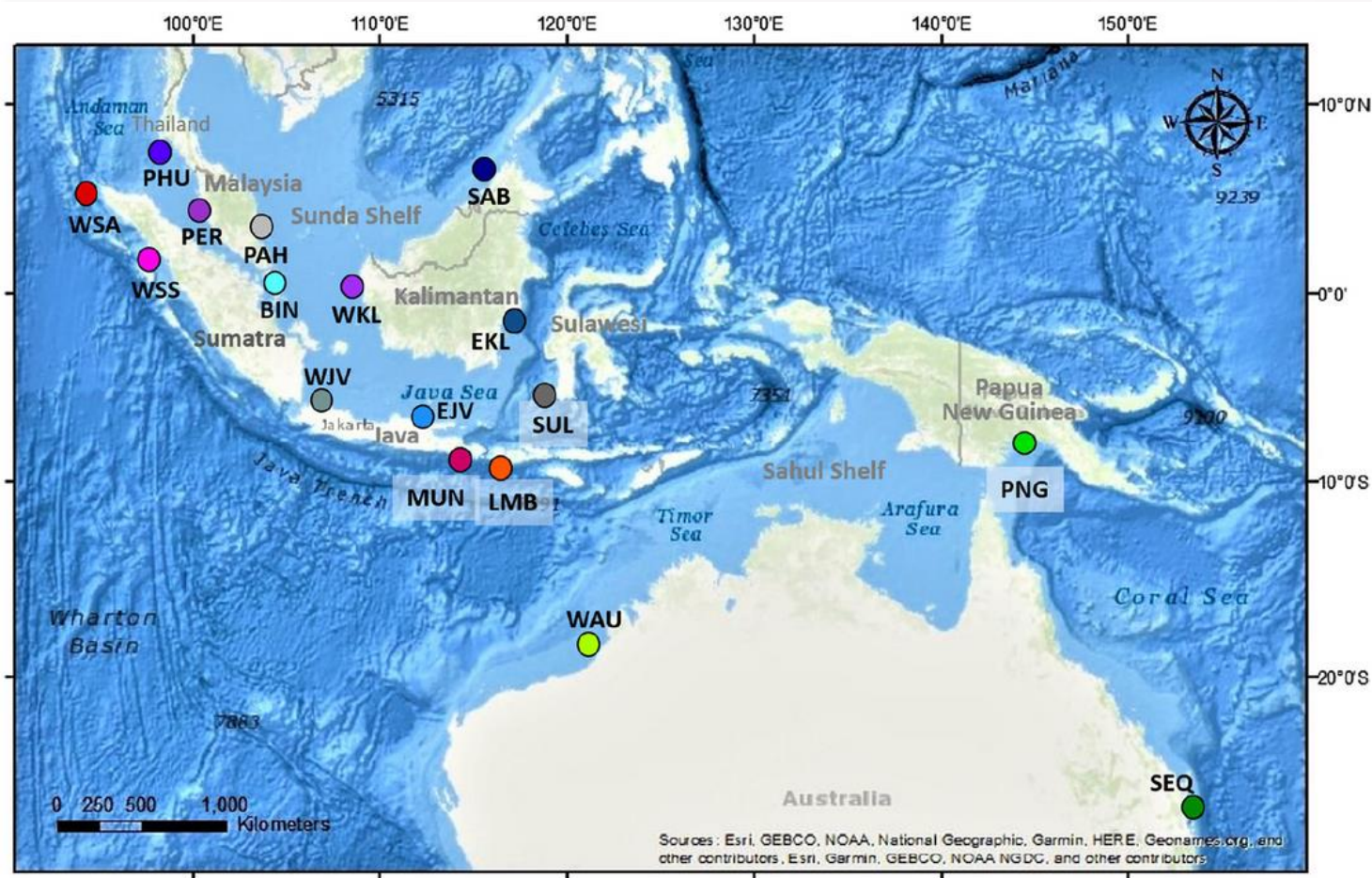
• .COI (610 pb)

• 3 methods

• Taxonomic studies are lacking!



Chiloscyllium punctatum



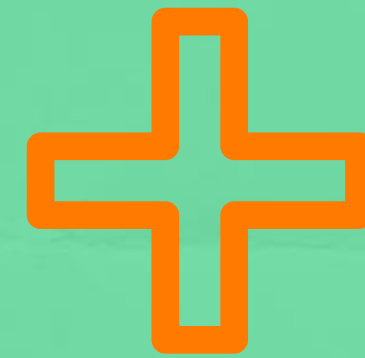
 . ND4 + genomic SNPs

 . Bloodlines with different threat levels

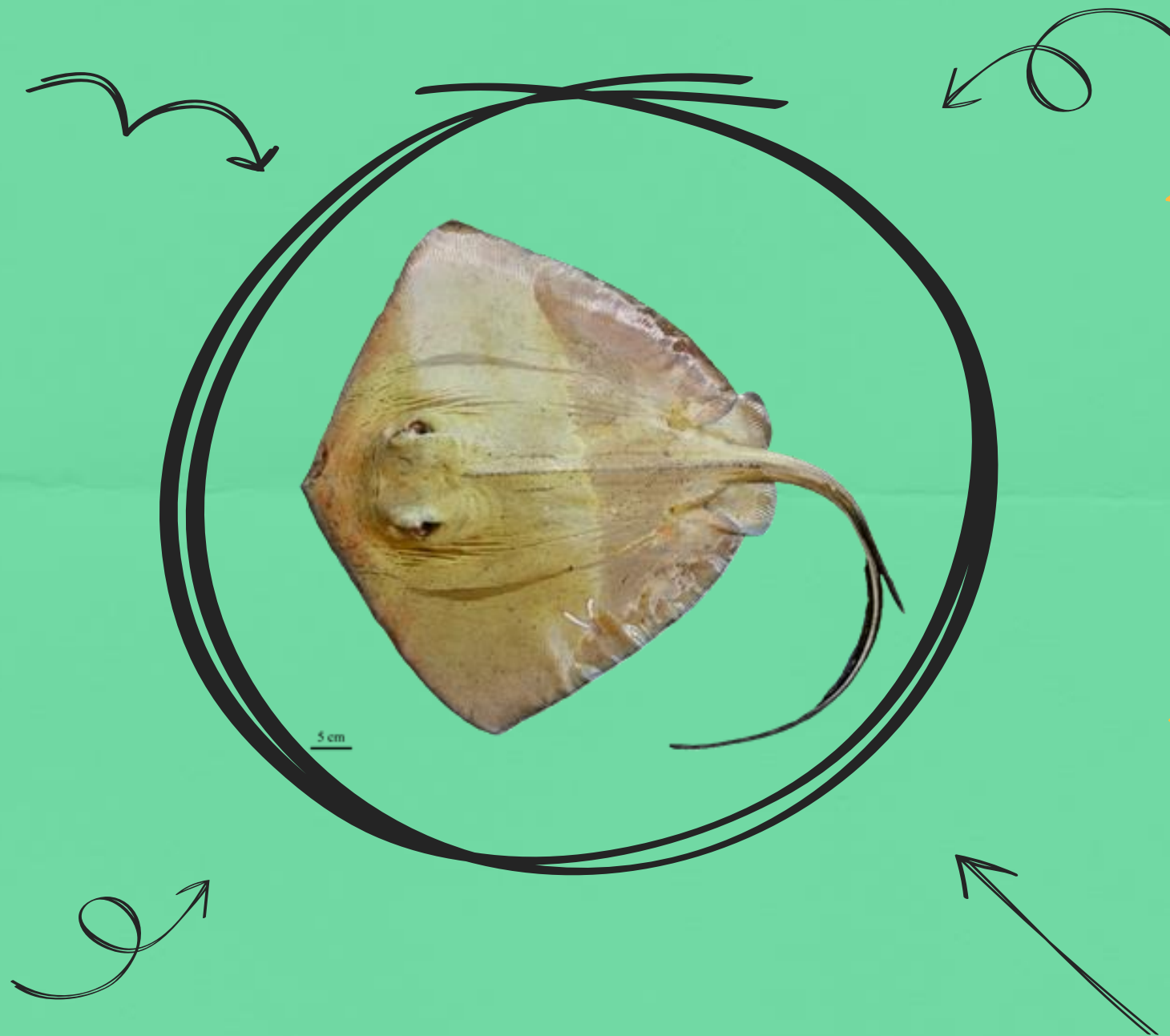
 . Morphology, biology, ecology?

How to combine

Lineage delimitation



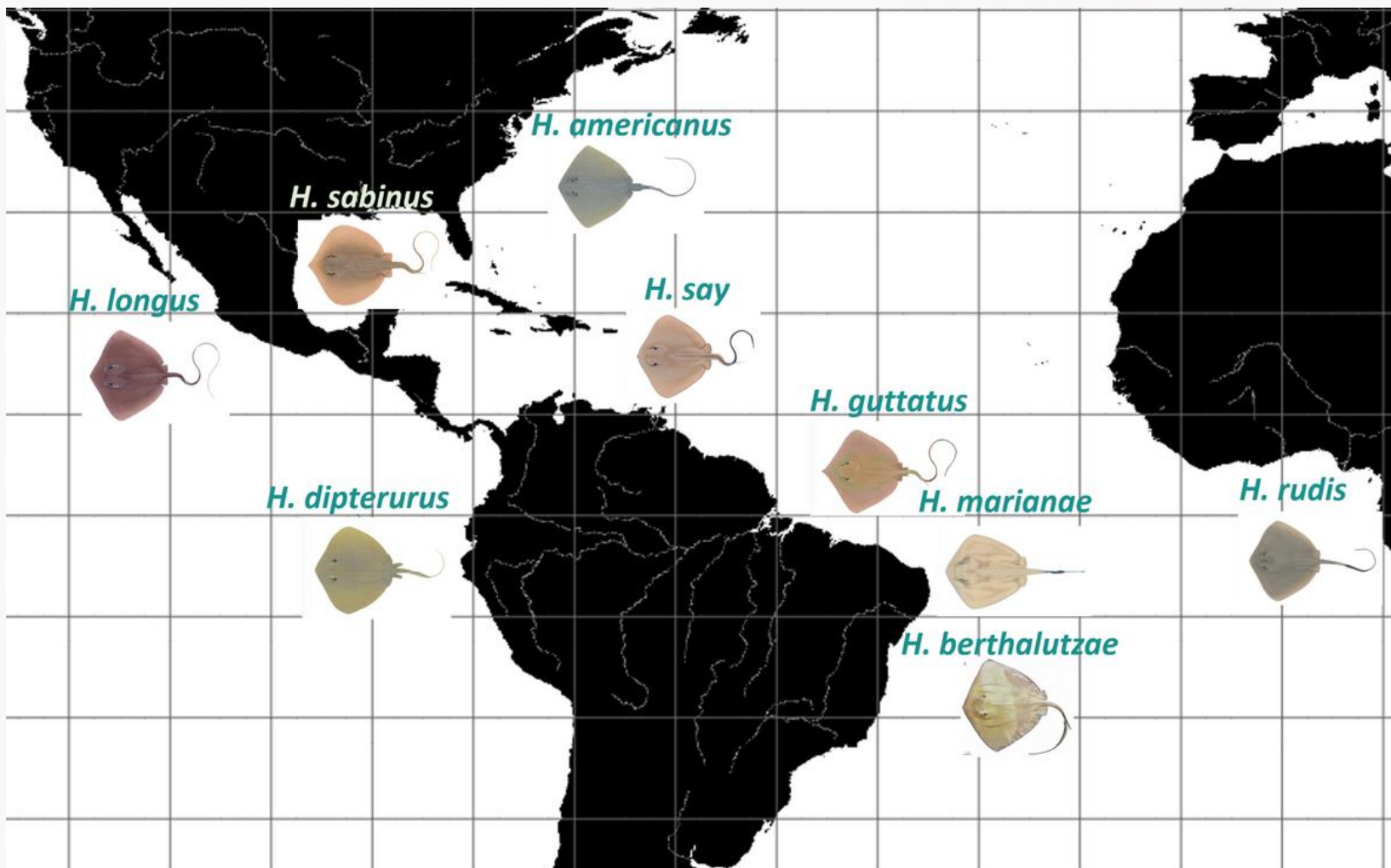
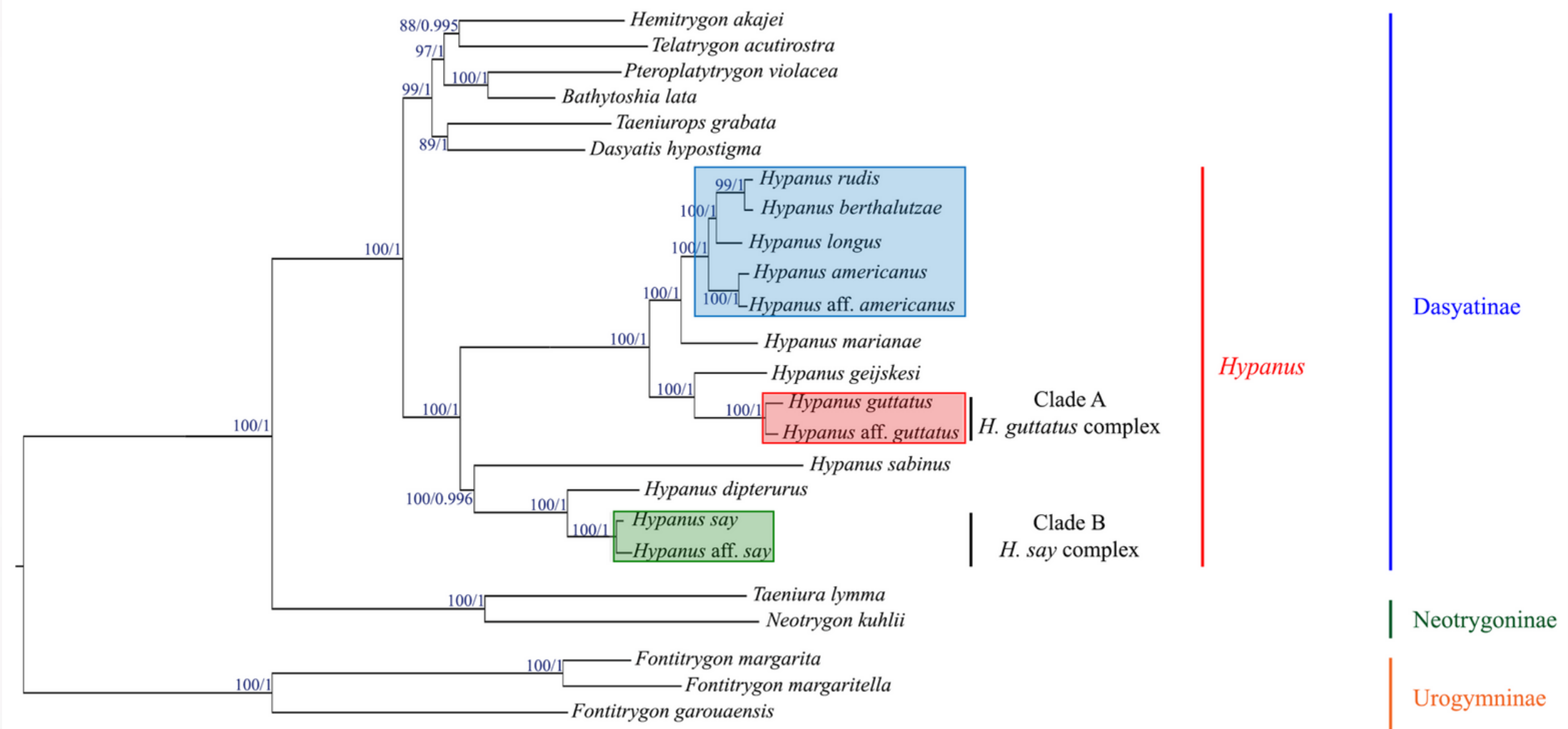
biogeography?



Hypanus

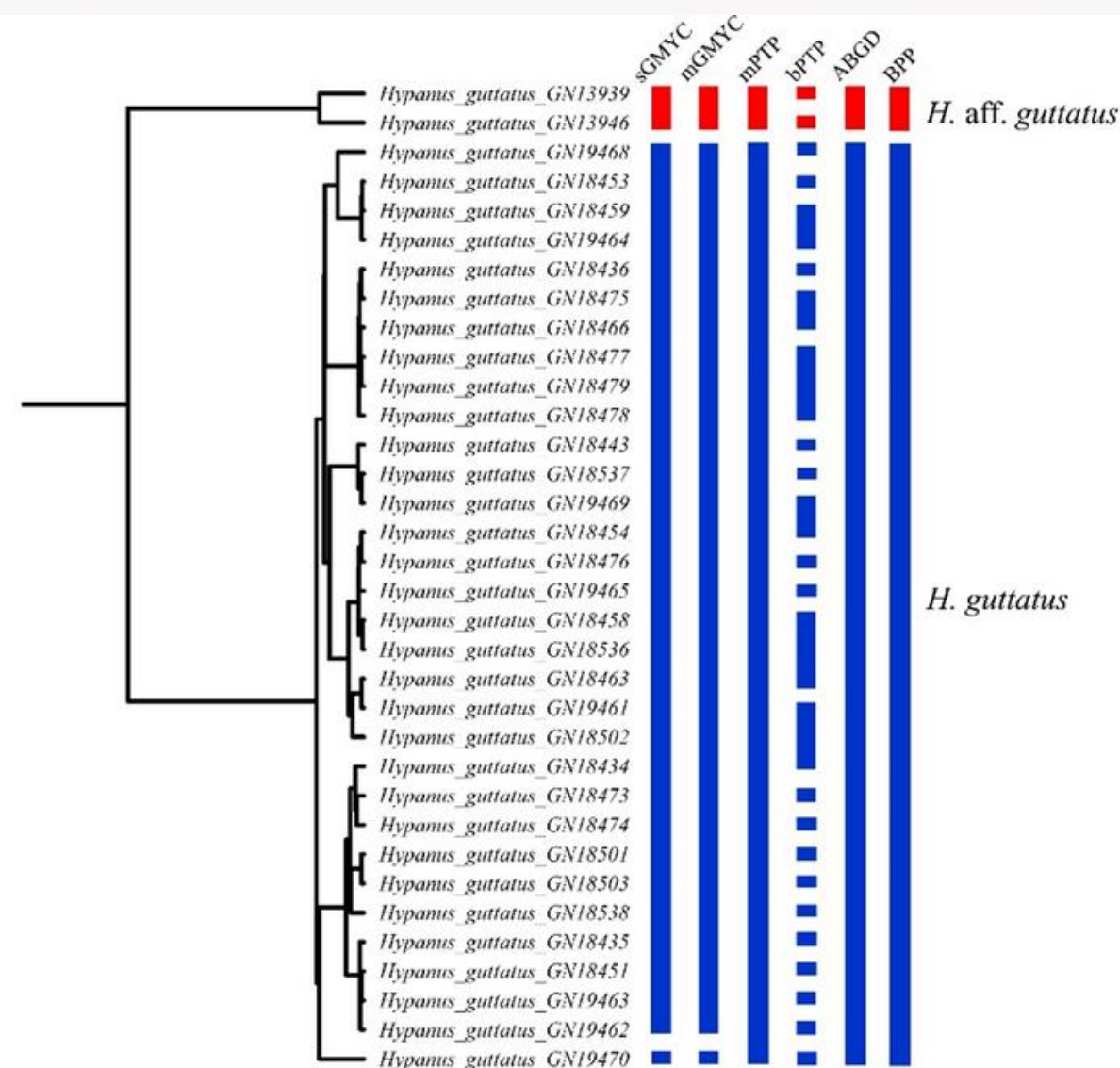
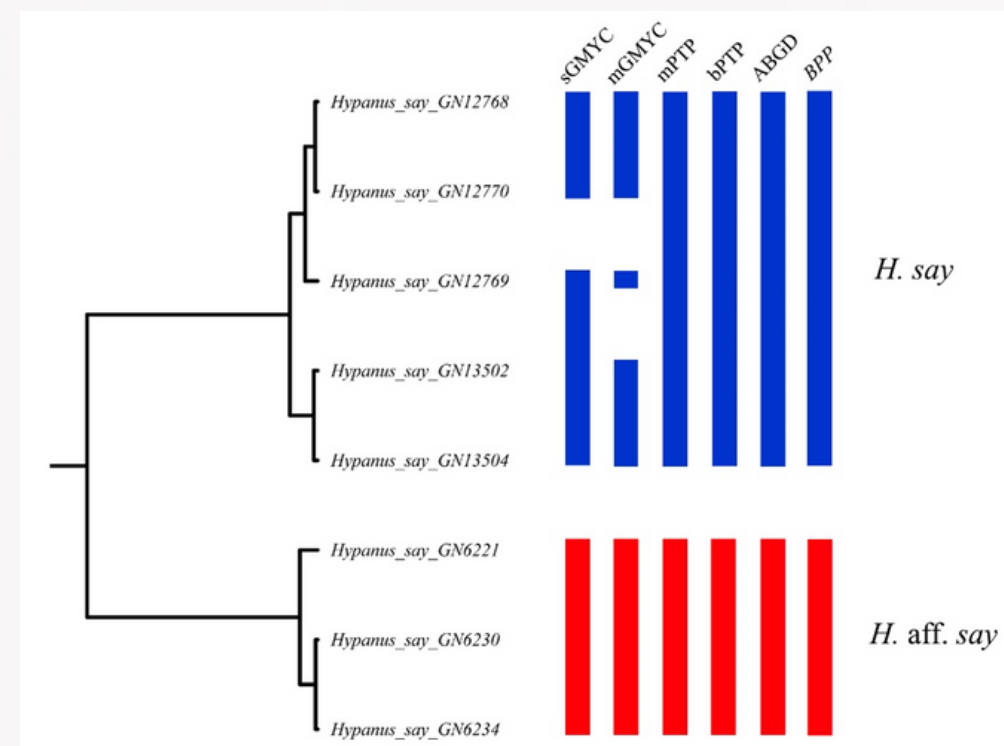
Phylogeny

W. Mitochondrial genomes



T. Phylogenetic analyses,
lineage delimitation,
biogeographic

0

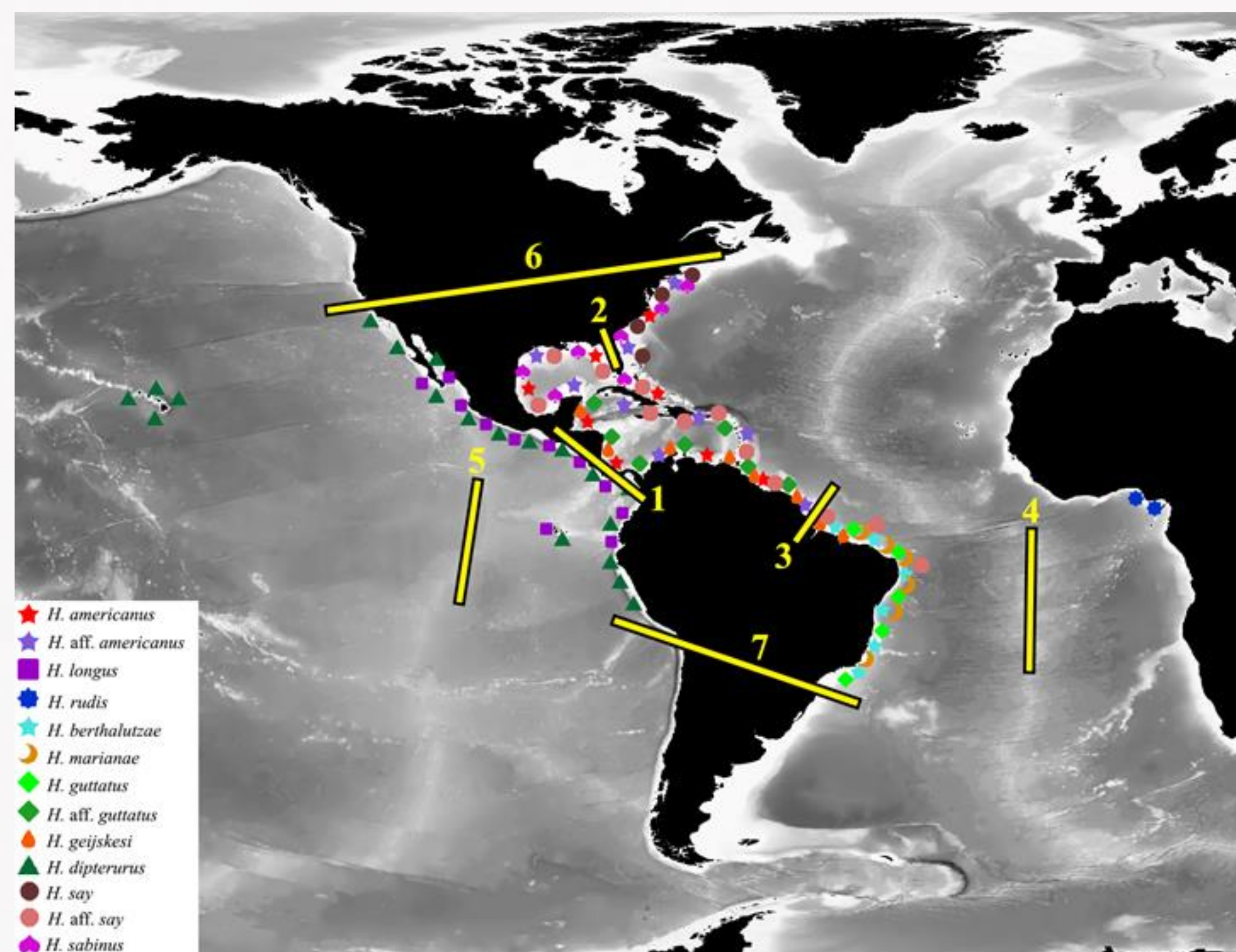
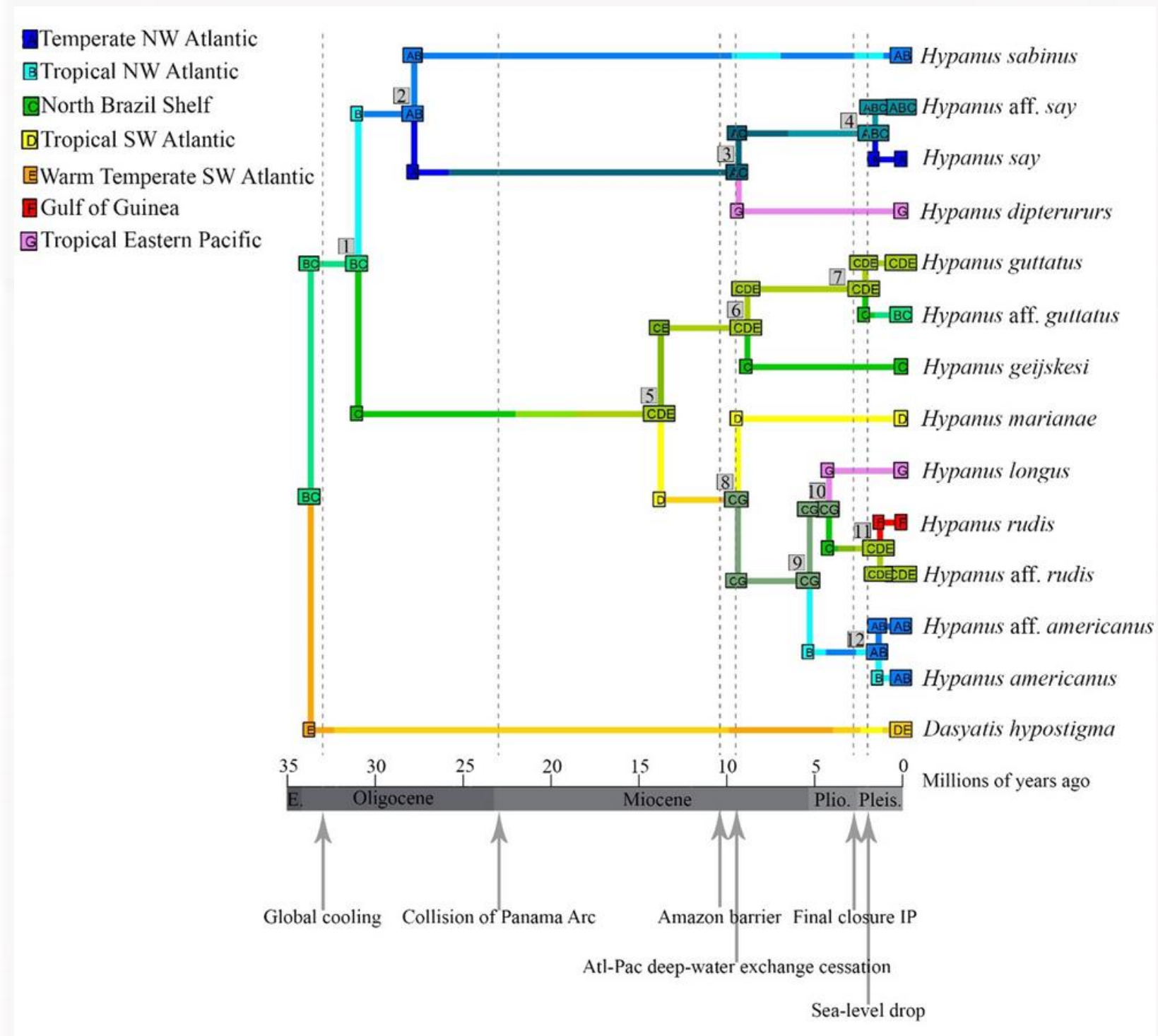


Petean et al., 2021
Petean et al., en prep

Petean et al., en prep

Hypamus

Biogeography



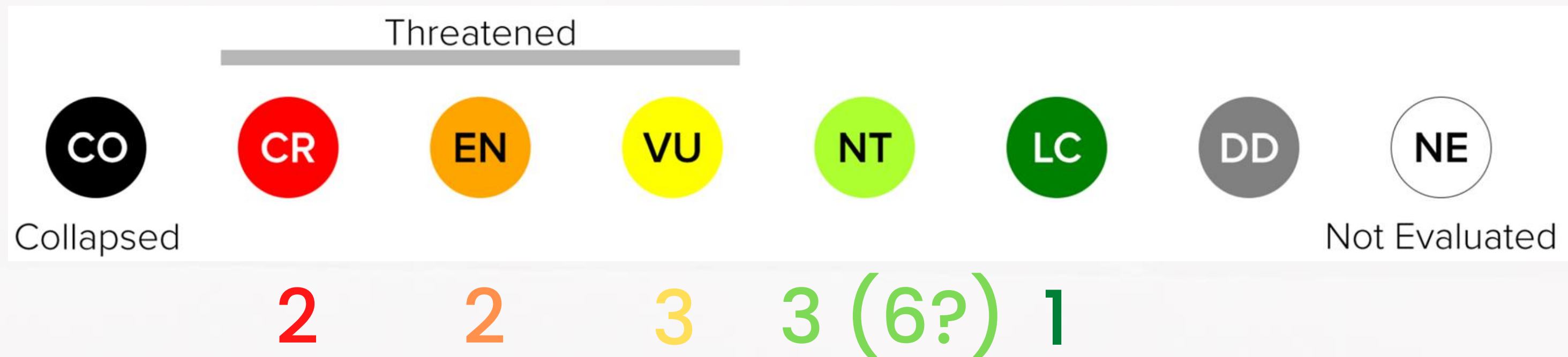
1 y 2: land
 3: salinity and sediment
 4 y 5: depth and distance
 6 y 7: temperature

Hypanus

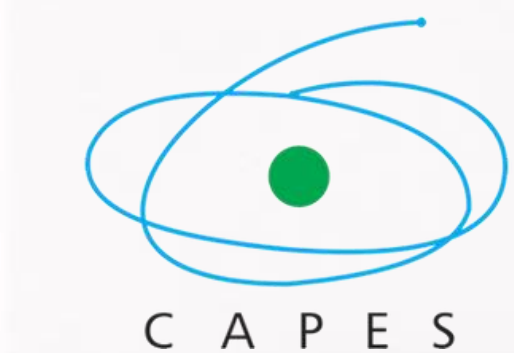
Conservation



1 species LC; others NT and threatened



If the new lineages are new species,
are they already threatened before
they are described?



Thank you!

 flaviapetean.weebly.com



@ictiomulheres

