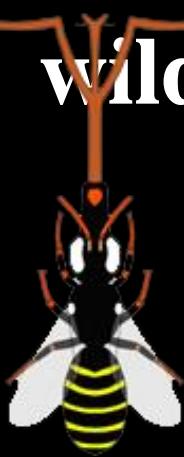


PLC YUU

wild bees – a prerequisite for conservation



Eucerinoda gayi | 669 [0n] bp
Tarsalia persica | 669 [0n] bp
Ancylia sp. 1 | 669 [0n] bp



*Agapostemon
virescens*

Outline

- The importance of bees
- Species identification and discovery through barcodes
- The campaign to barcode the bees of the world – progress and prognosis

BEES

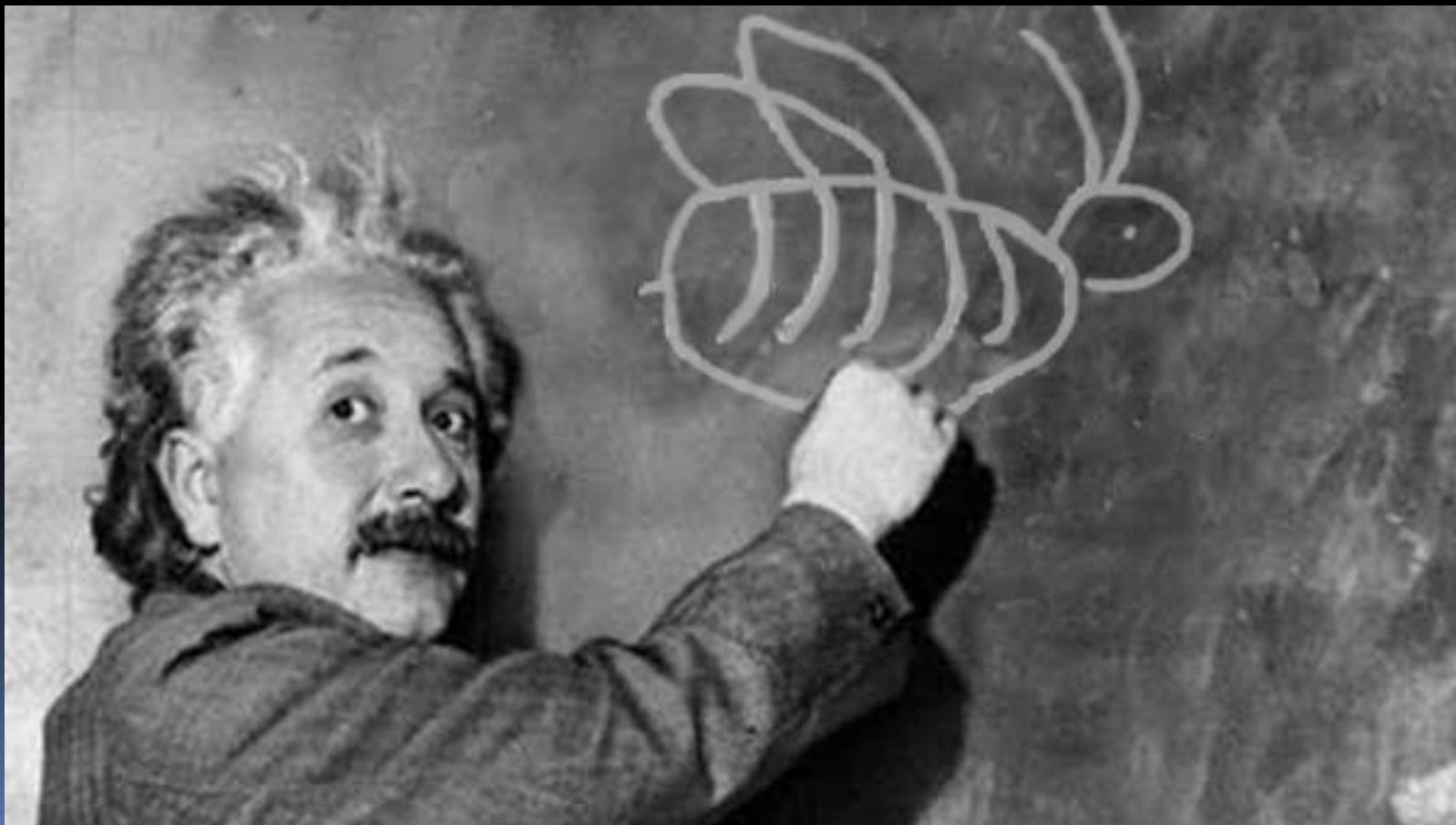
OF THE WORLD



CHRISTOPHER O'TOOLE & ANTHONY RAW

Bees and Our Food

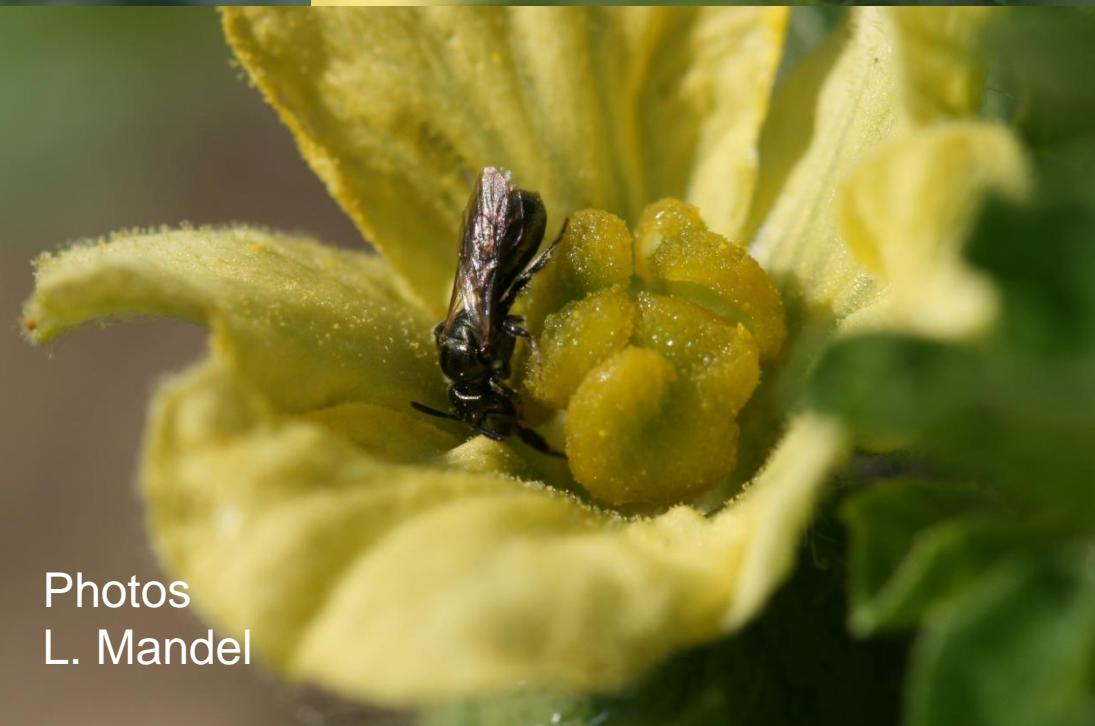
- “If the bee disappeared off the surface of the globe man would have only four years of life left”



n







Photos
L. Mandel

Identification and discovery 1: *Halictus* “*ligatus*” in Canada & the USA

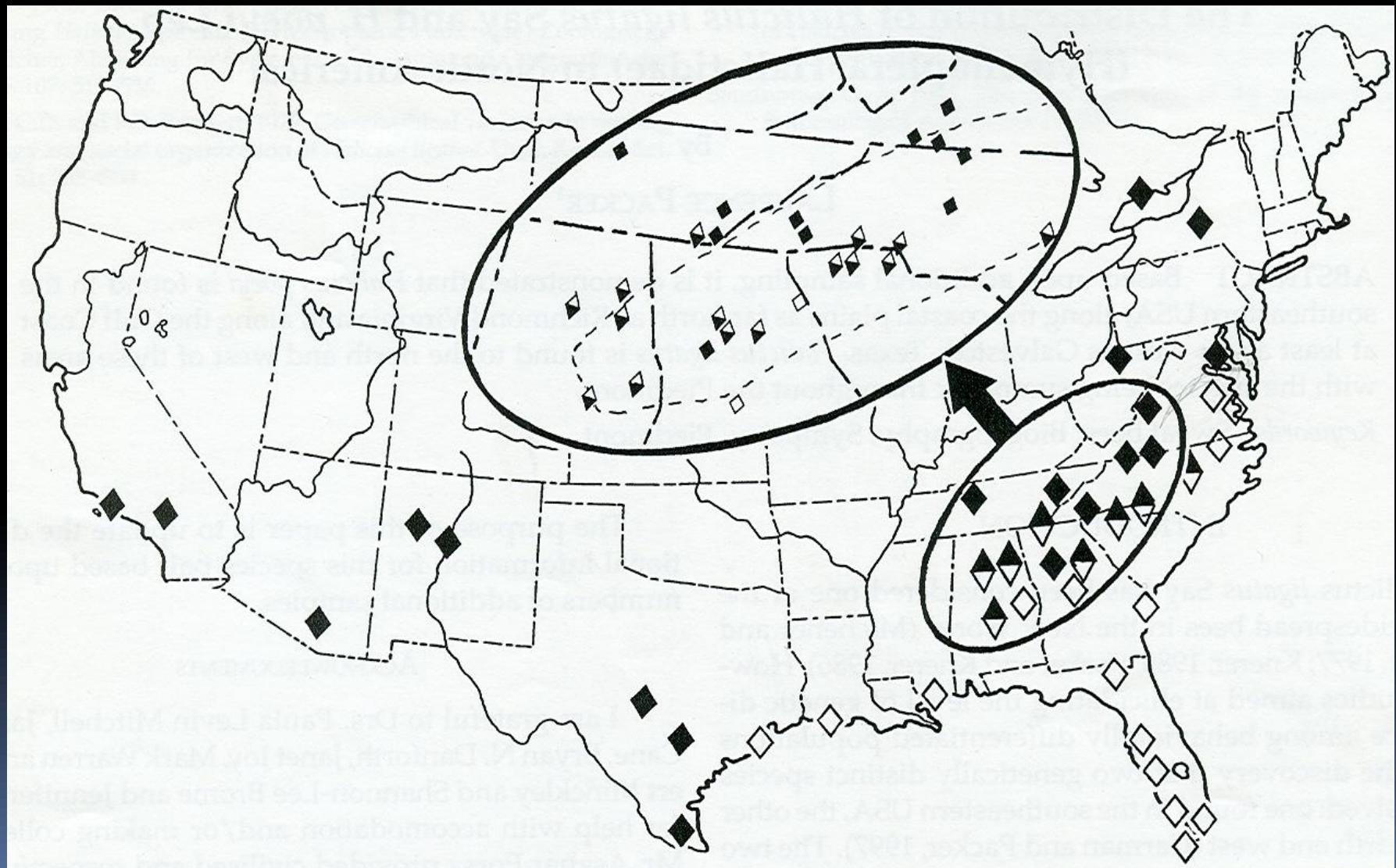




Is two species that
are morphologically
exactly the same
but genetically they
are very, very
different



They are sympatric in the Piedmont region of the Appalachian mountains







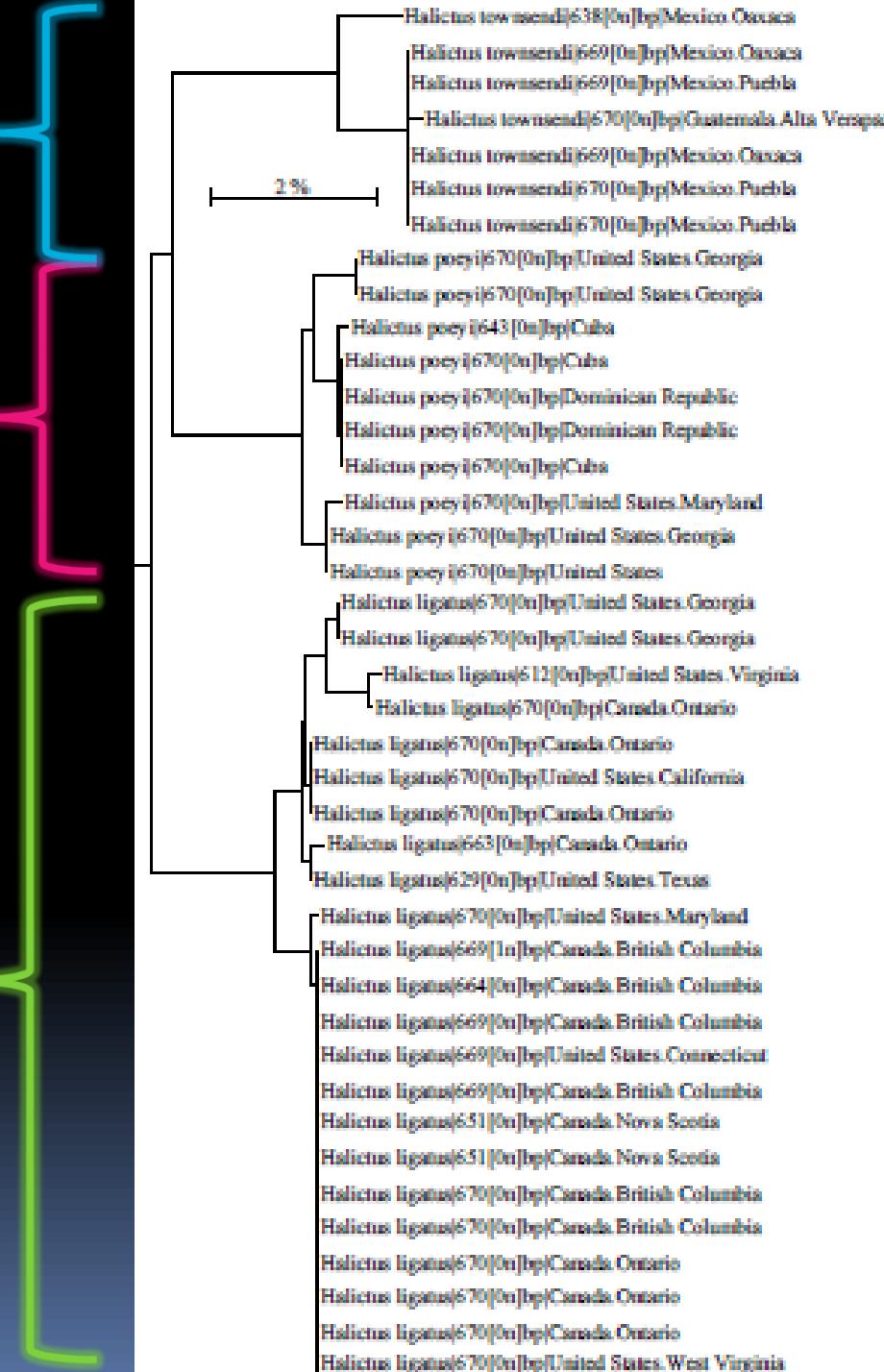
H. townsendi



■ *H. poeyi*

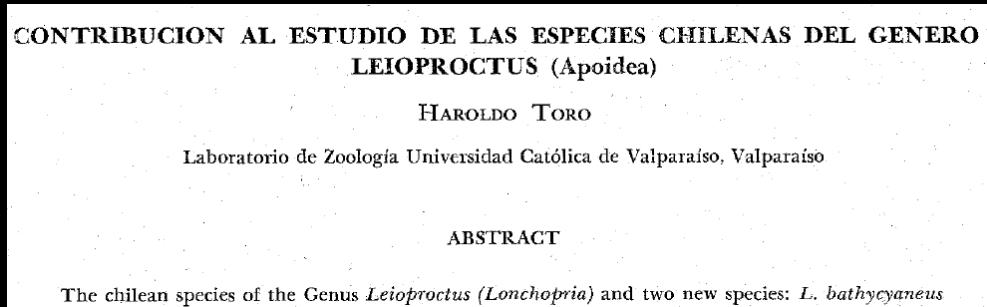


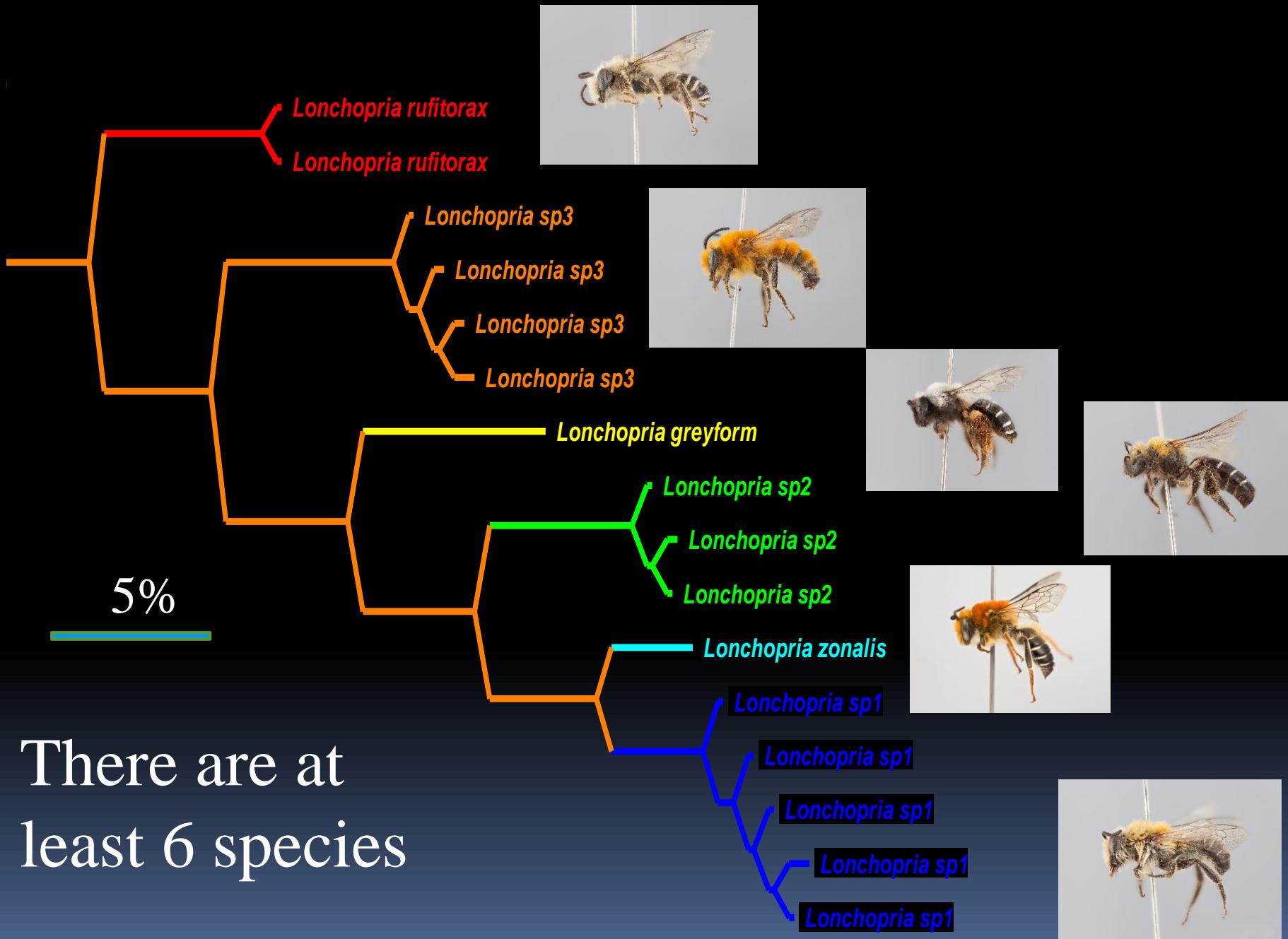
H. ligatus



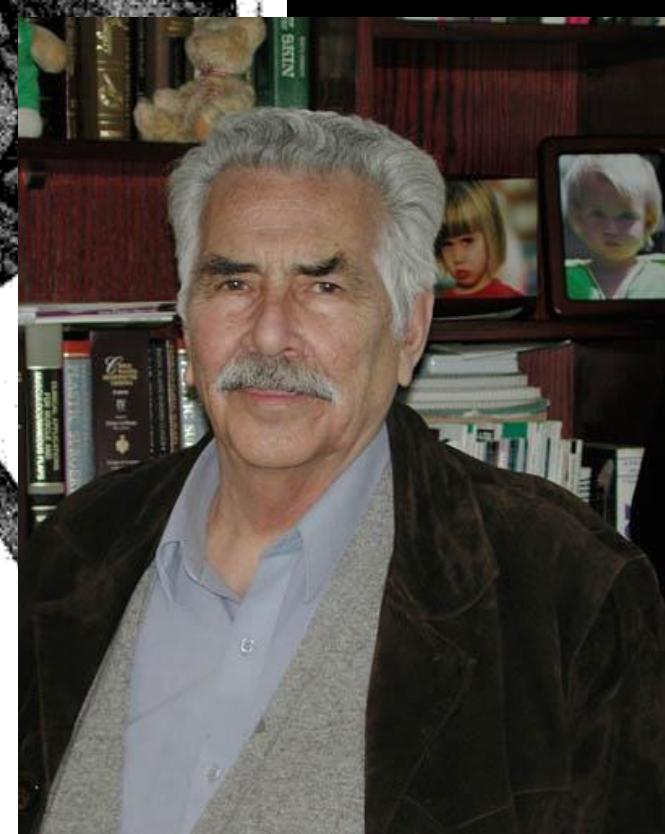
Identification and discovery 2: *Lonchopria*

an example of barcoding helping us find morphological differences

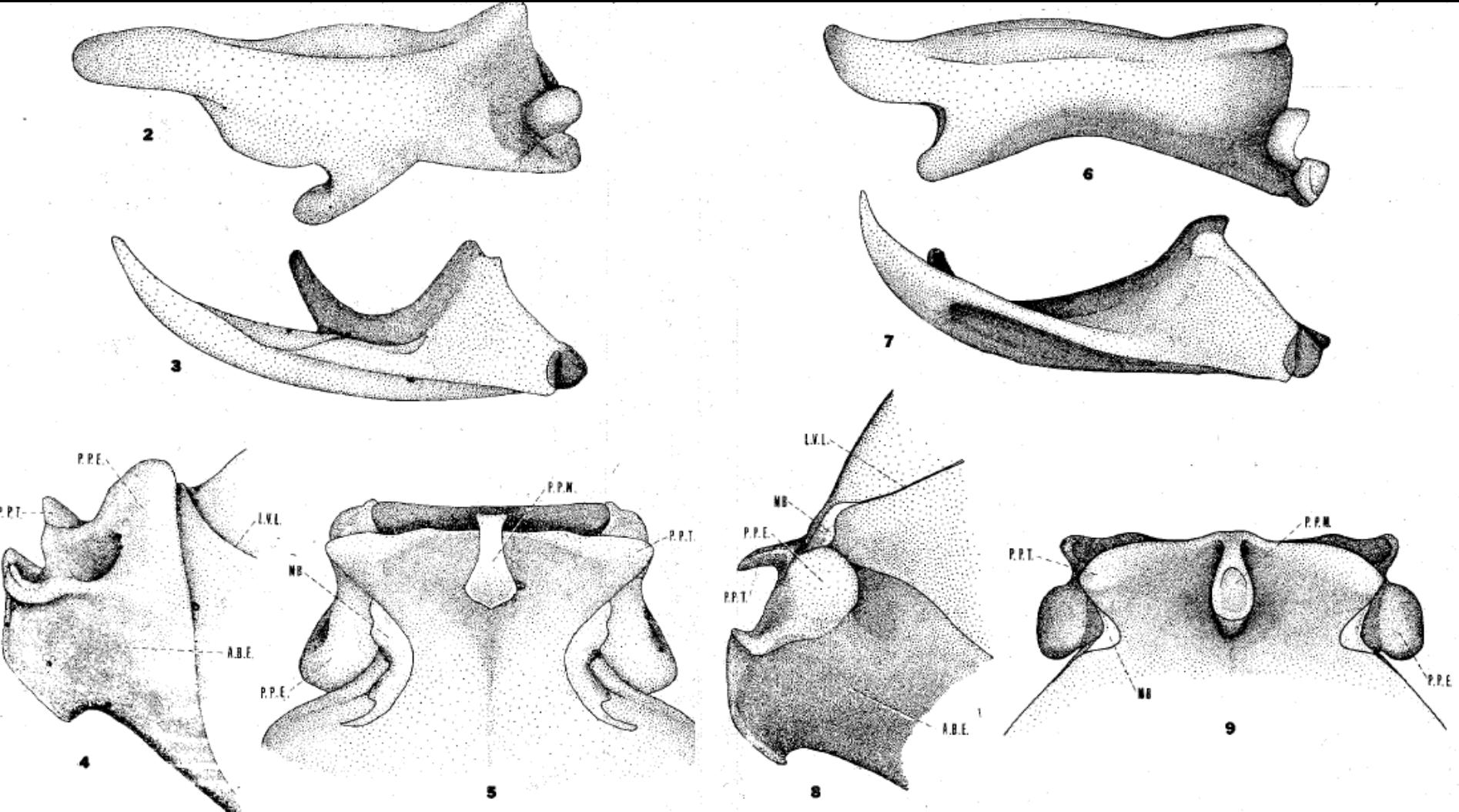


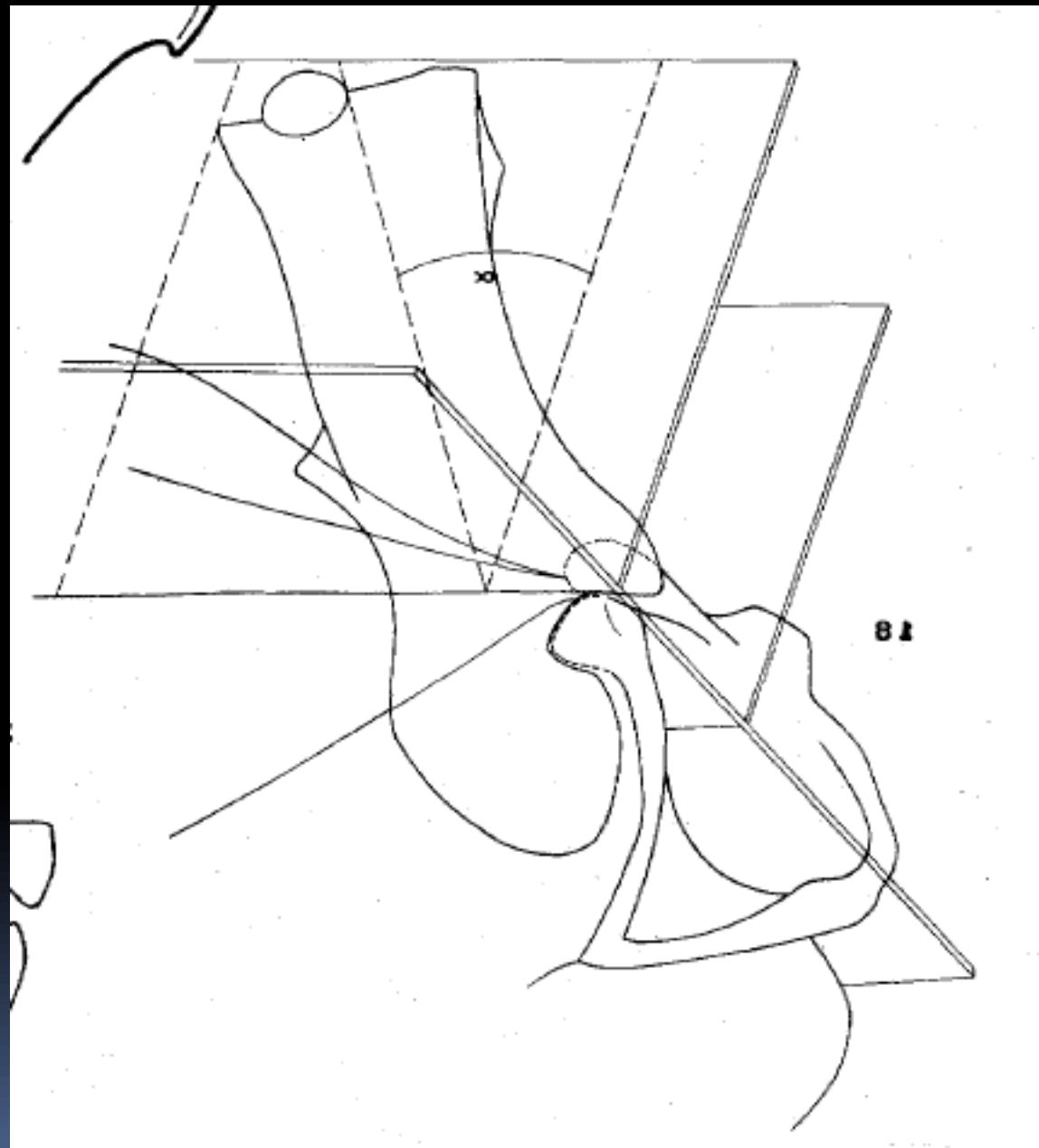


1



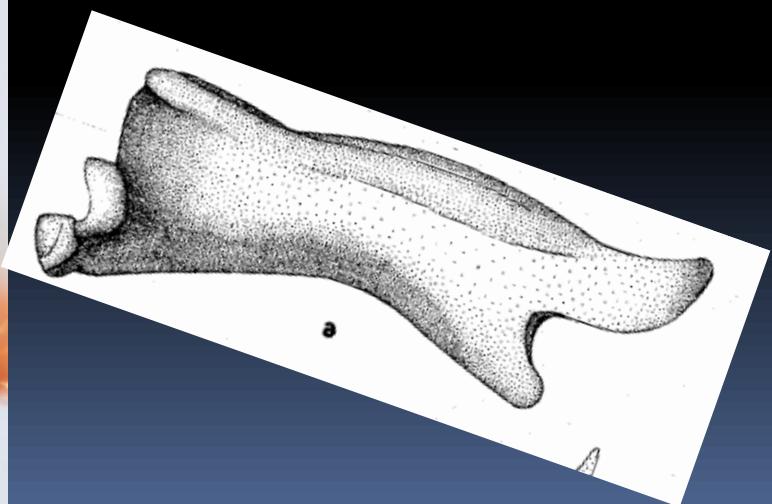
Male mandibles and base of female metasoma modified







IN THE STUDIO



Identification and Discovery 3: *Liphanthus*

33 described species, 29 from Chile.

Most barcode clusters have been examined by the expert who described 22 of the 29 Chilean species – Luisa Ruz



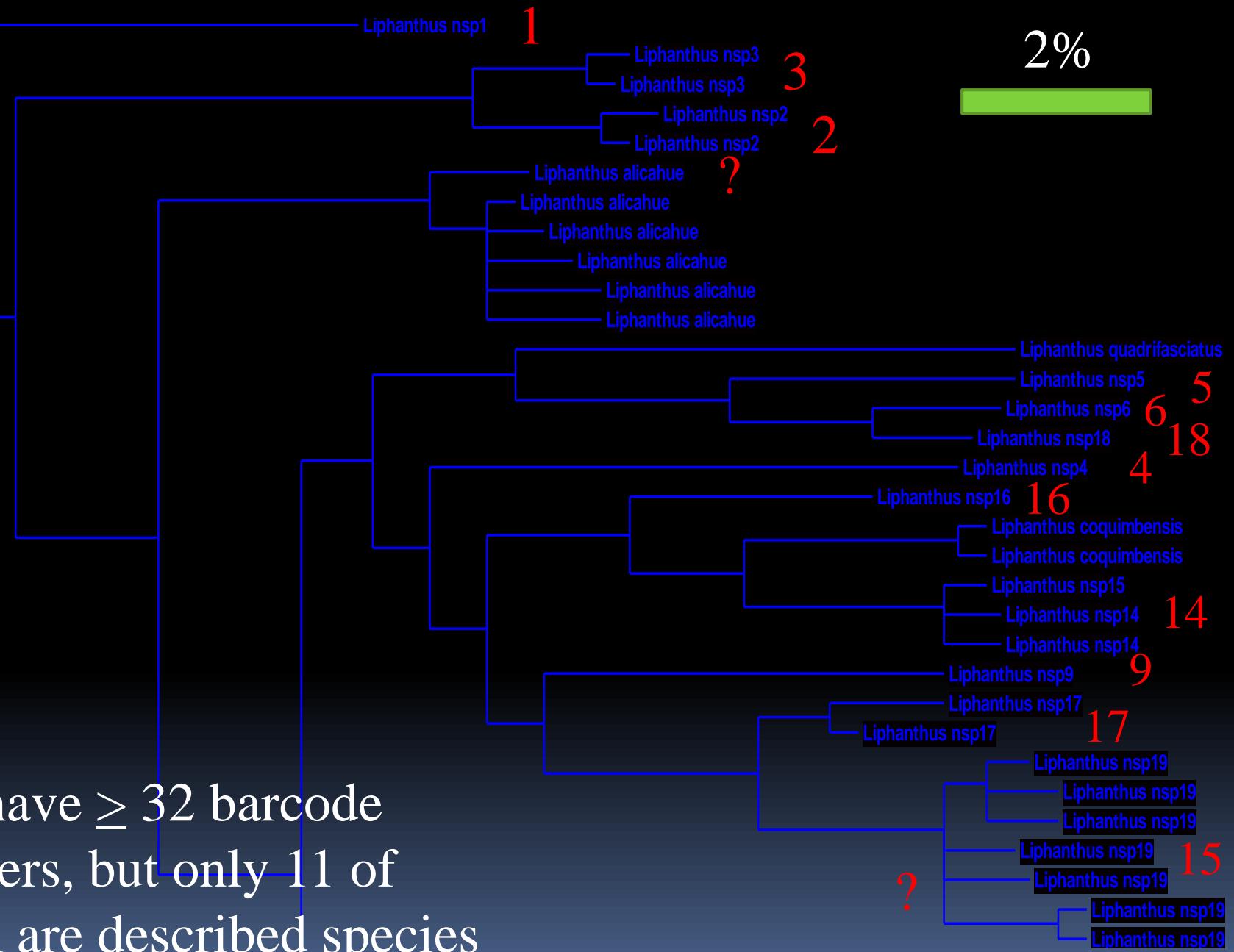
Strong sexual dimorphism

Male

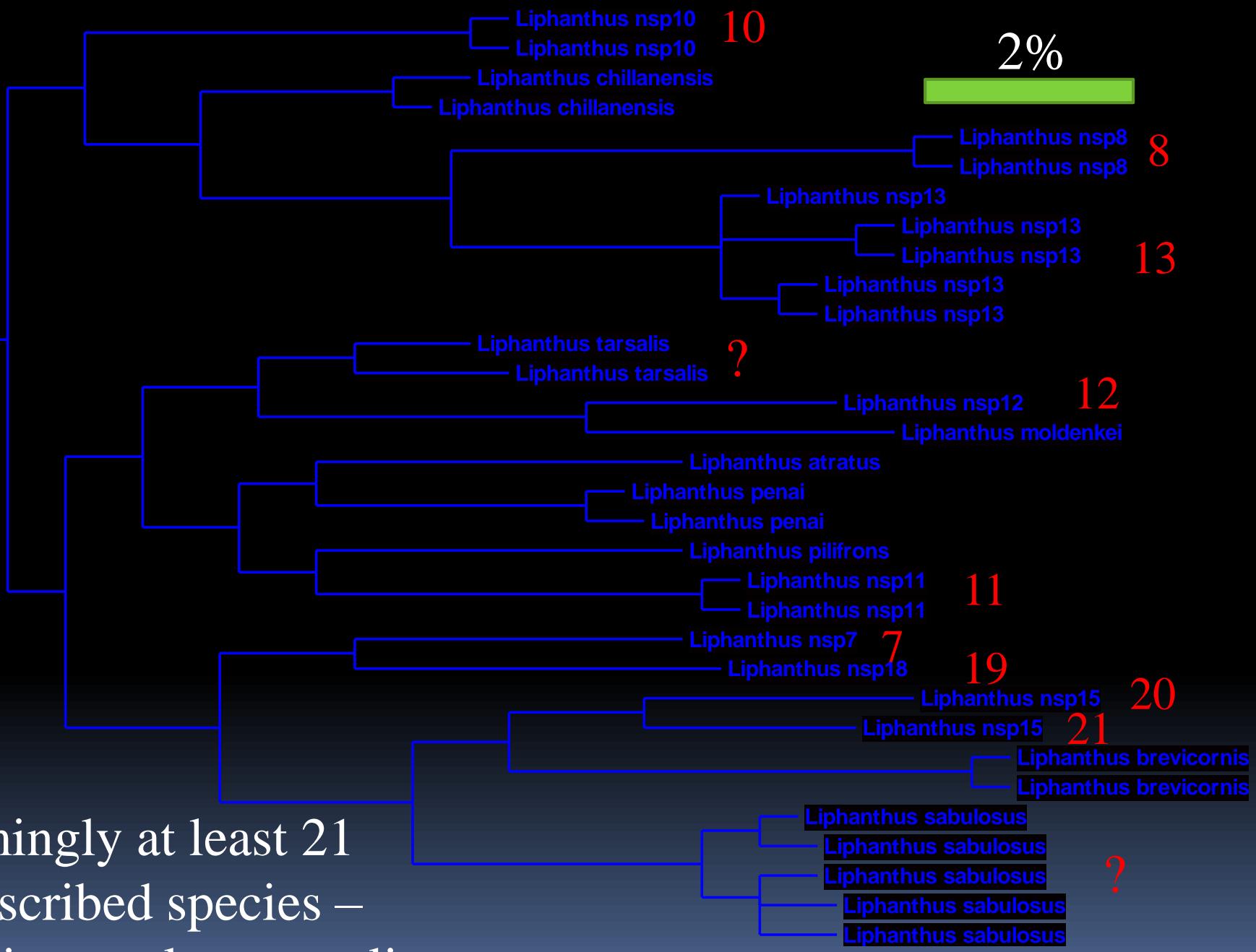
Liphanthus sabulosus

Female





We have ≥ 32 barcode
clusters, but only 11 of
them are described species



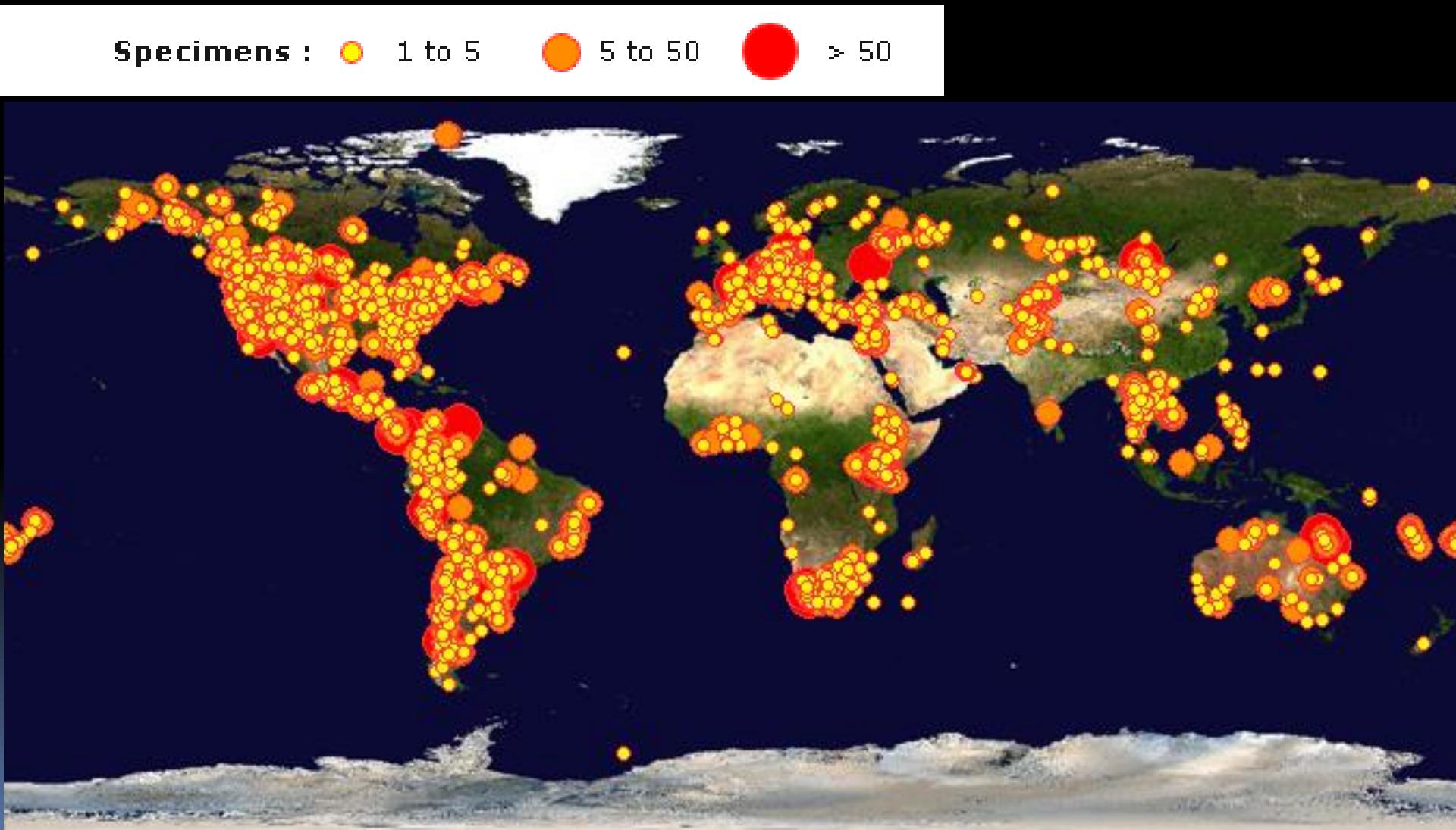
The campaign to barcode the bees of the world



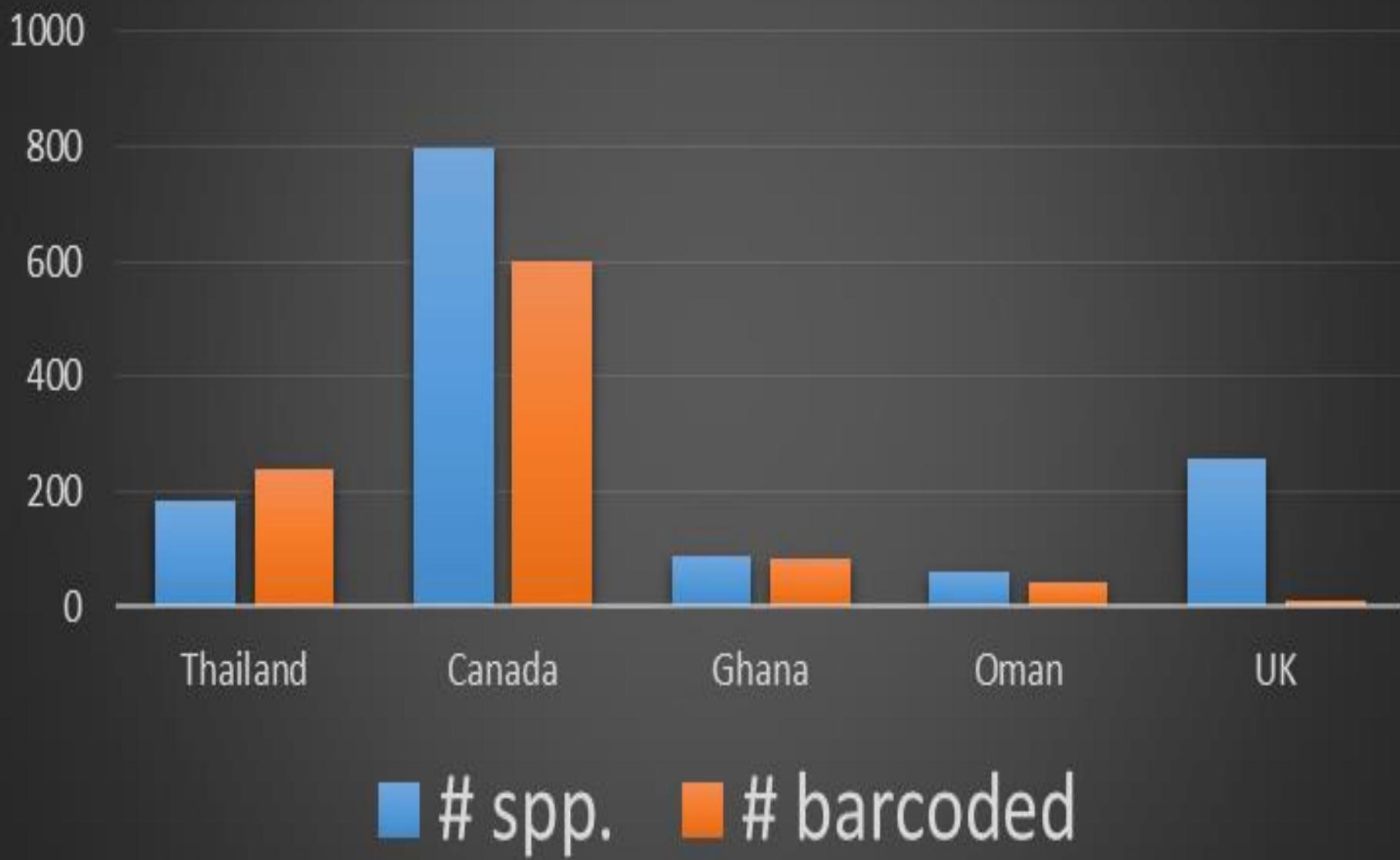
Barcode the Bees of the World
"Barcodeando" las Abejas del Mundo
"Barcodeando" das Abelhas do Mundo

Geographic Coverage of Bee Barcodes: Data as of August 30th 2013

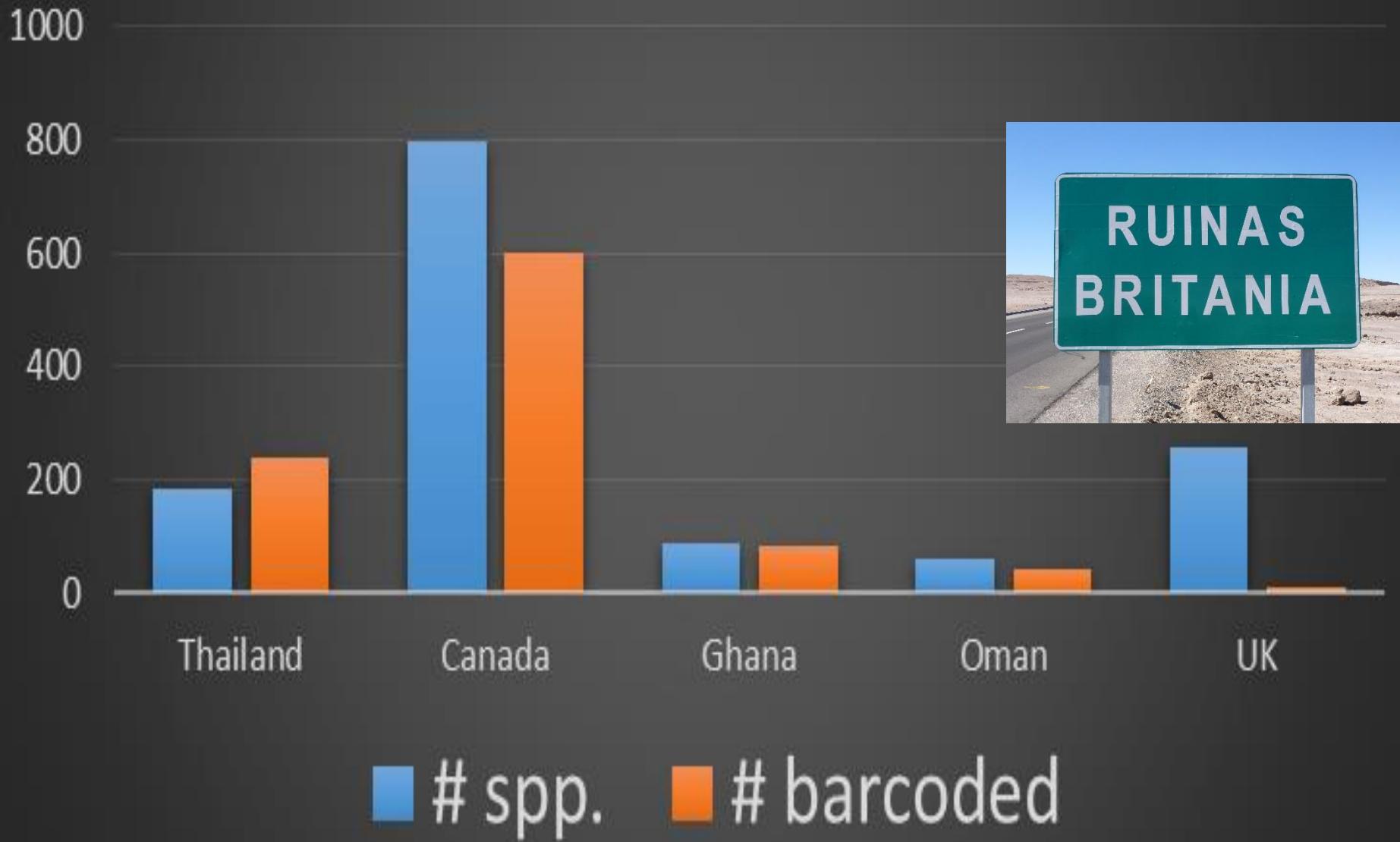
Specimens : ● 1 to 5 ● 5 to 50 ● > 50



geographic coverage



geographic coverage





90% of ~500
genera have at
least one barcode

~30% of 20,077
species have at
least one barcode

HELP?

- We still need bees from throughout the world.
- Whenever there are flowers in bloom there will be bees flying: please catch us some!
- Just using plastic cups with soapy water inside will work.



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- Many workers at BIO for (diligent, careful and enthusiastic lab work)
- Julie Stahlhut for troubleshooting.
- **COLLABORATORS**
- By now, this represents almost all bee researchers worldwide.



Thanks for listening



Photo courtesy Dr.
S.F. Sakagami