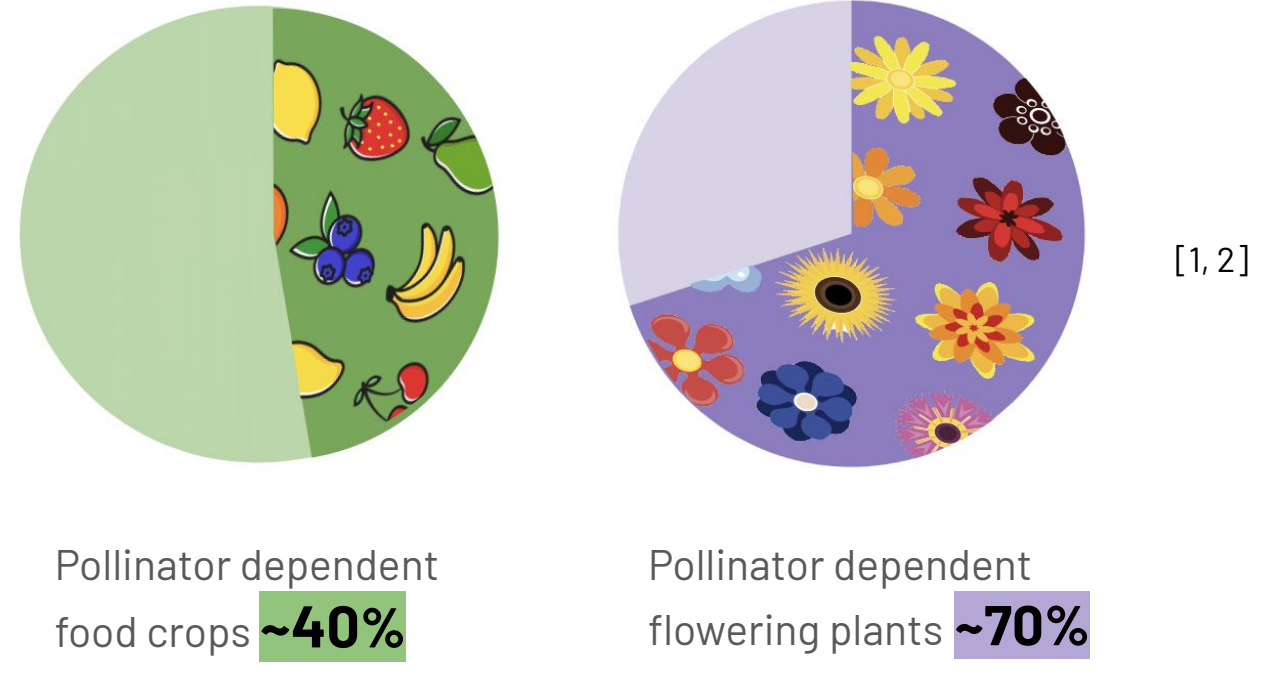


## Bees are essential

- Agricultural sustainability
- Ecosystem function

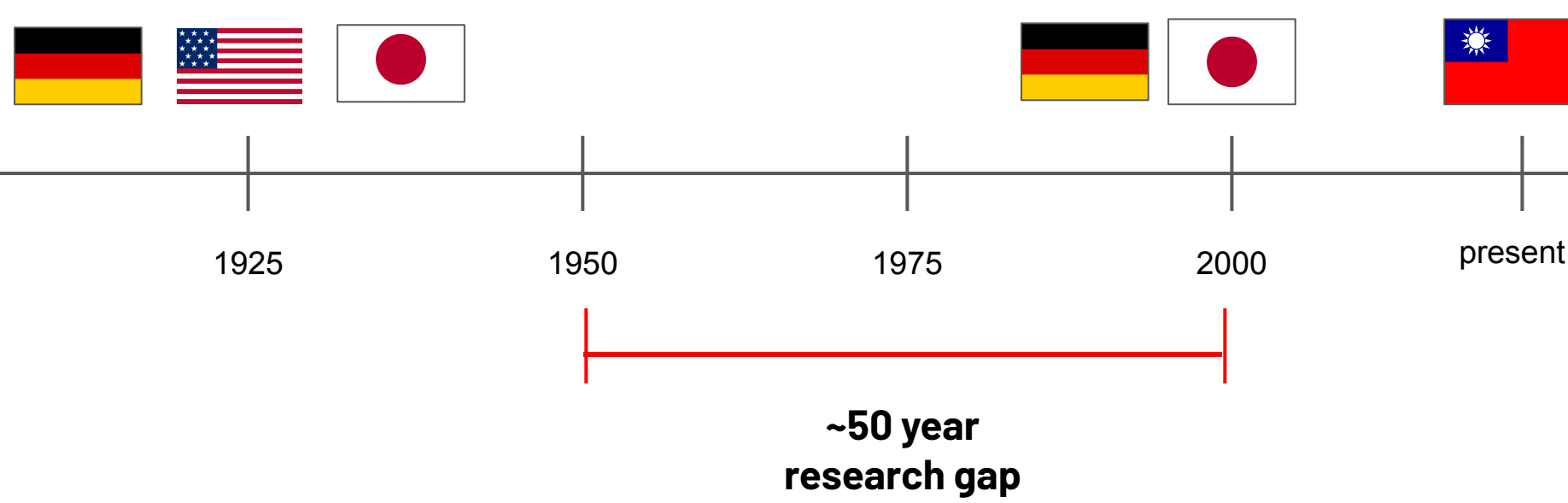
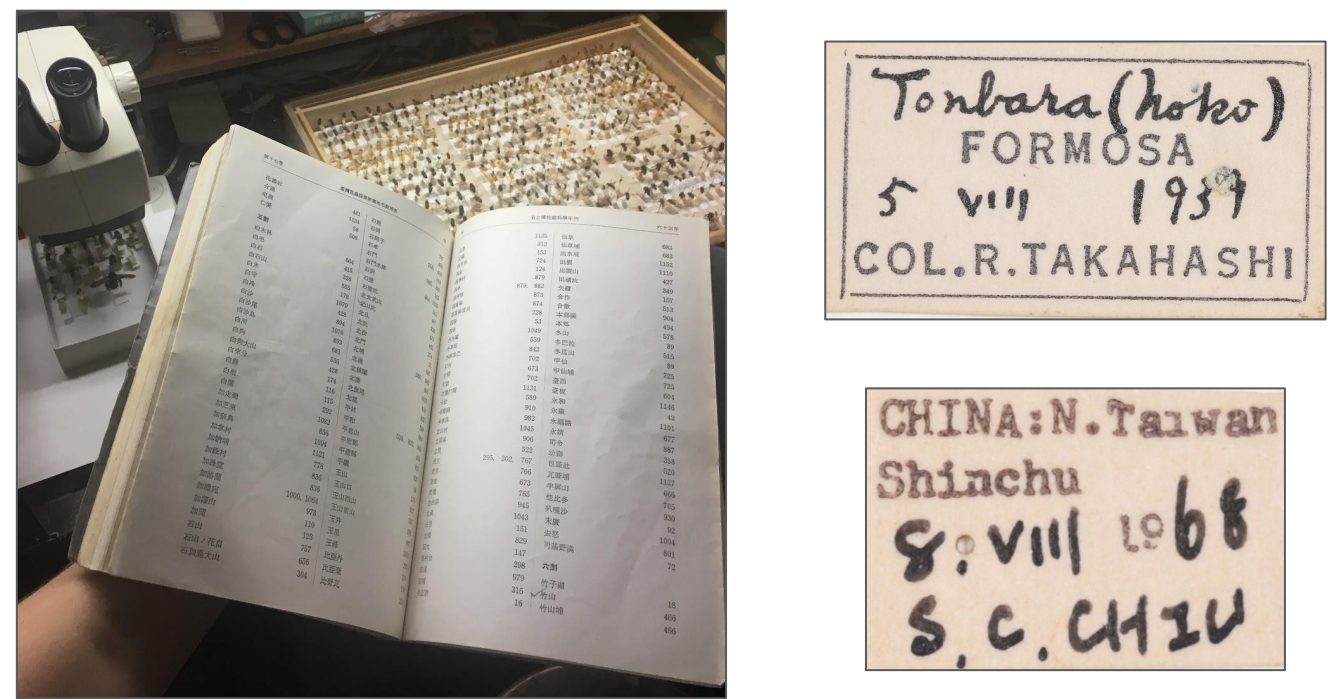


## Bees are in decline



## Research efforts are biased...

- Bees are unsampled in over 80% of land area in the global South [3]
- Over 70% of online bee records come from the global North [4]
- Disenfranchisement of local efforts due colonial and exclusionary practices, location of voucher specimens, and language barriers



## 181 bee species recorded!

Family	Genera	Species
Apidae	14	67
Halictidae	8	56
Megachilidae	7	41
Andrenidae	1	9
Colletidae	2	8
TOTAL	33	181



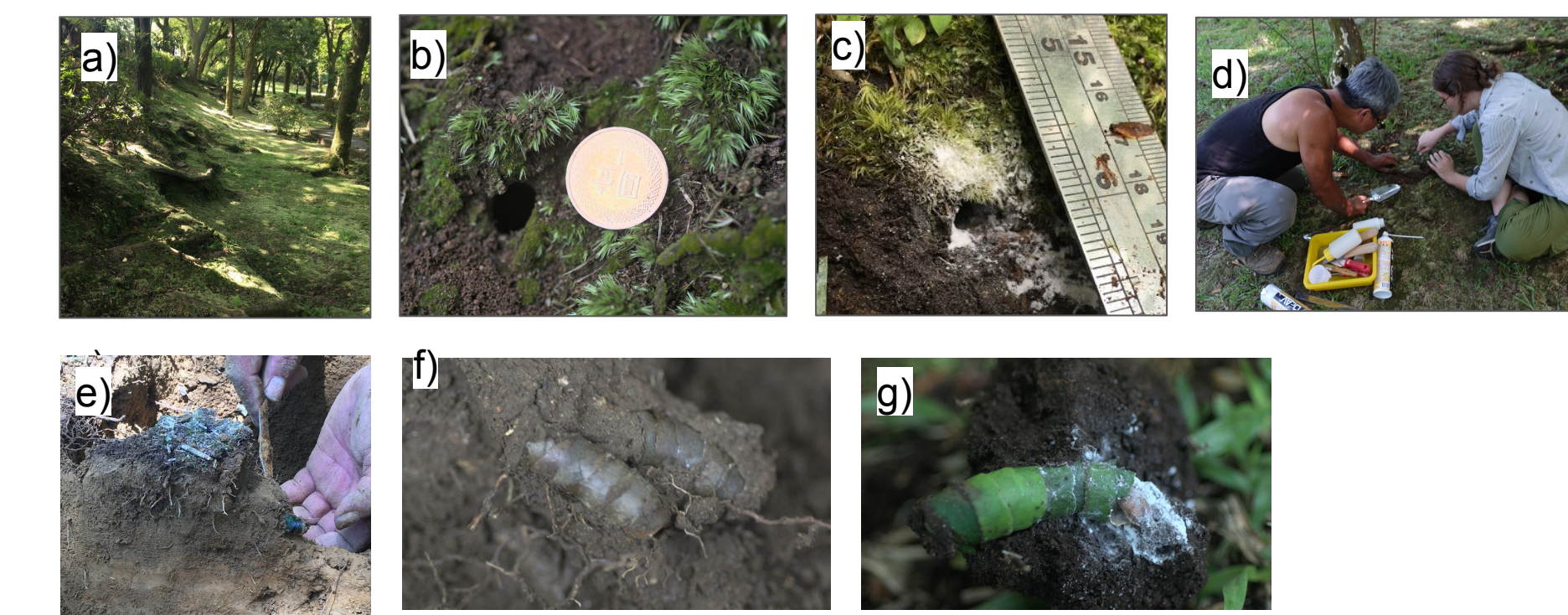
## New record and nesting biology

*Trachusa (Paraanthidium) muiri* aff.

Part of the 'longicornis group' species complex found predominantly in Nepal, India, and China [5, 6]



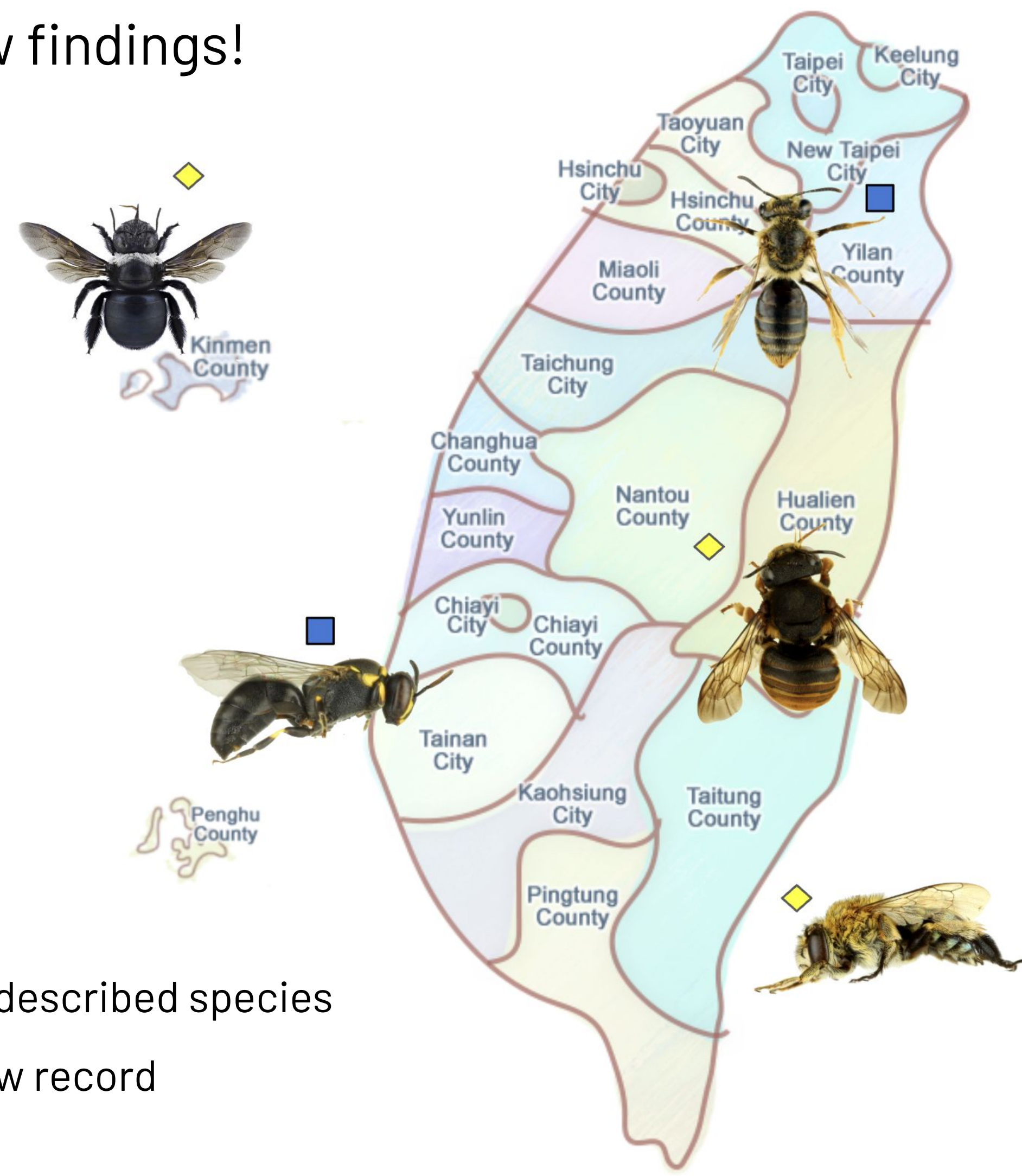
**Key characters:** a) 5 obtuse mandibular teeth, broad at tip, b) punctate, omaulus concave anteriorly, c) medially emarginate scutellum



**Nest excavation:** a) Qianshan park, b) nest entrance, c) tracing tunnel, d) digging, e) removing the first cell, f) two older cells in a chamber, g) new incomplete cell with fresh leaves

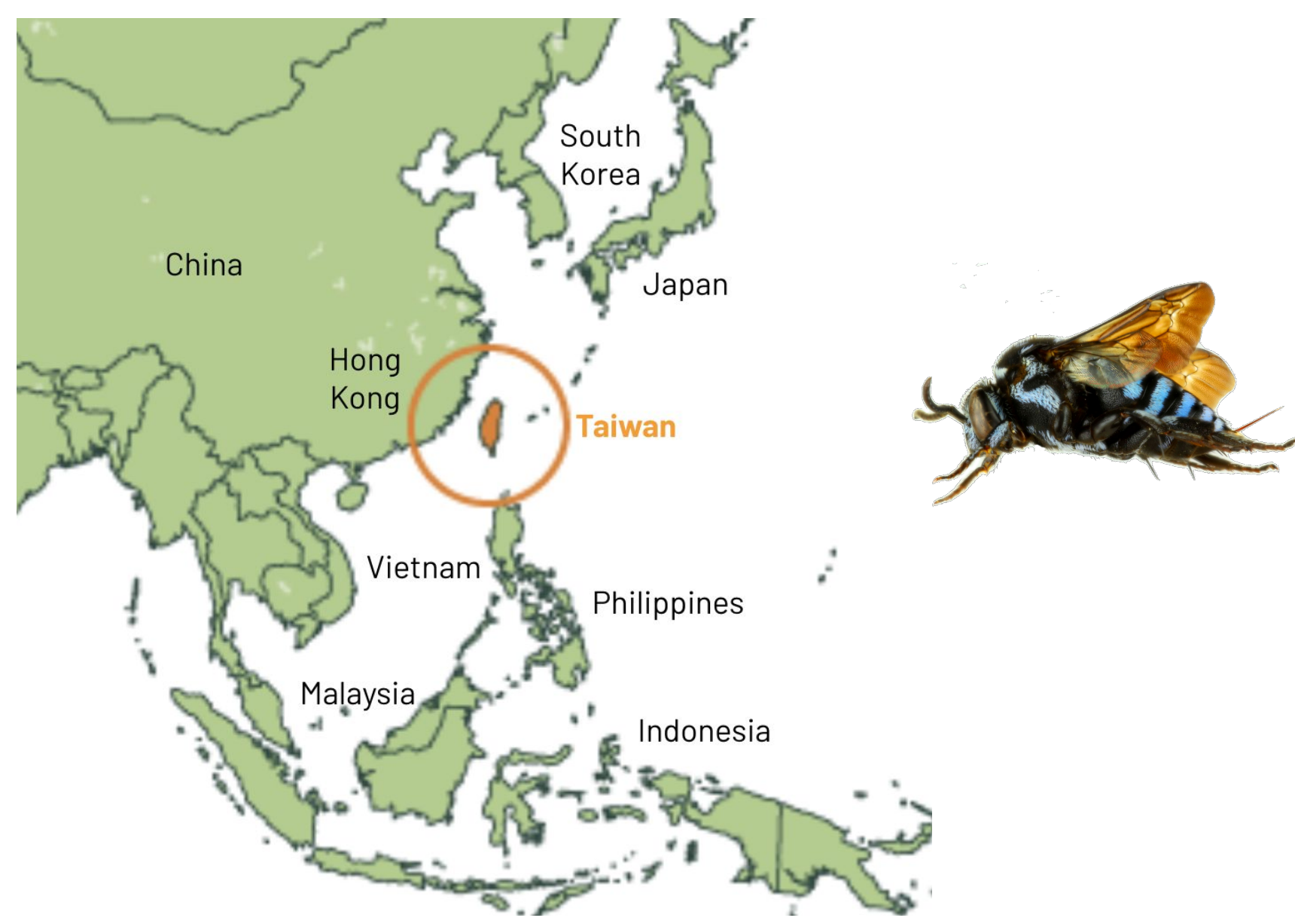


## New findings!

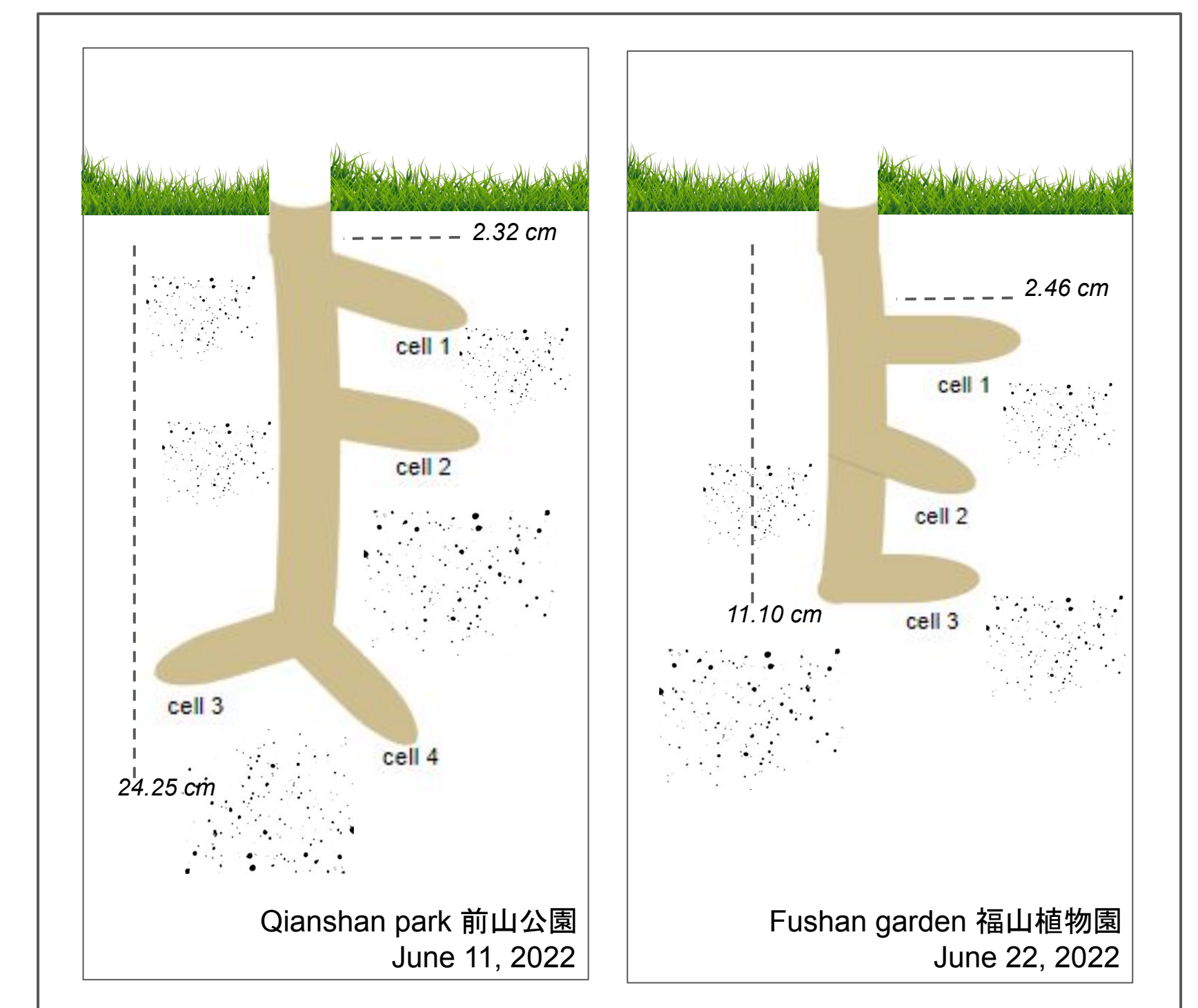
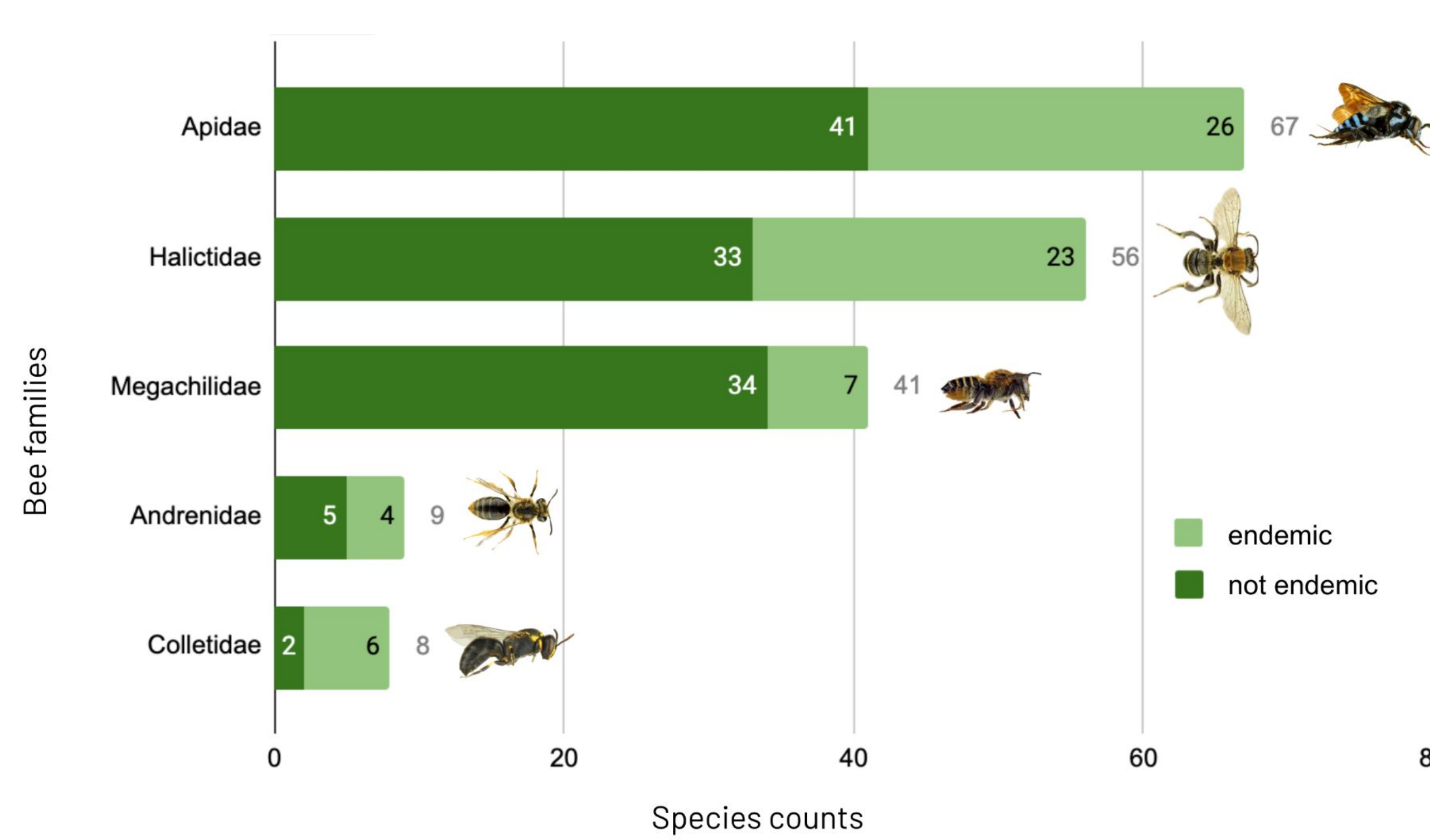


## Project goal

Establish a bilingual, open-source, and species level checklist of Taiwan's bee fauna



## ~30% of Taiwan bee species are endemic



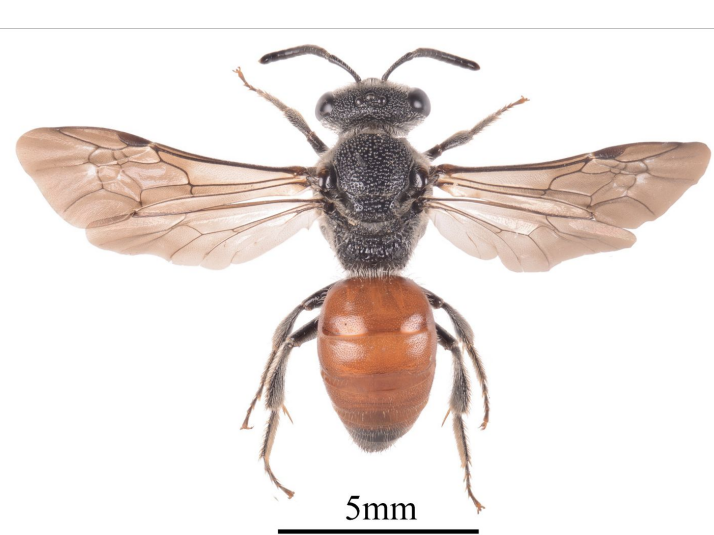
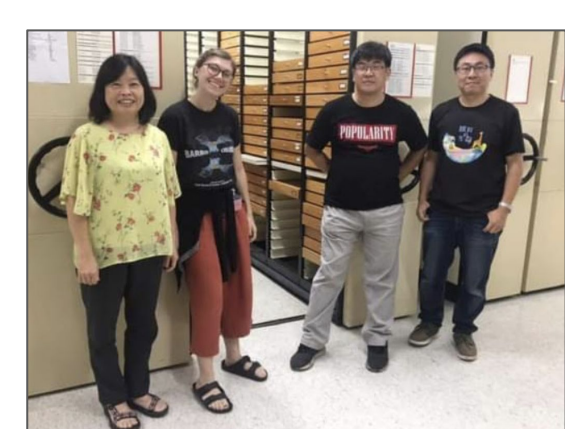
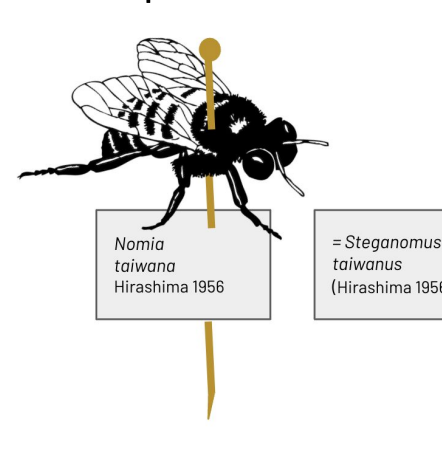
Nest diagrams from two different areas of north Taiwan



**Origins of *T. muiri* aff.**  
Oldest record found at TARI, collected in 1919 Wushe

## Methods

- Combine records** from online databases
- Validate** species names
- Confirm species** by visiting collections
- Accessibility** Chinese names and web platform  
Bee/wasp- 蜂 蜂  
*Hylaeus*- 面具蜂  
miàn jù fēng (masked bee)  
*Lipotriches*- 突領彩帶蜂  
tū lǐng cǎi dài fēng (ribbon bee)  
*Sphecodes*- 盜寄隧蜂  
dào jì suǐ fēng (parasitic halictid)
- Digitization** for species assessment

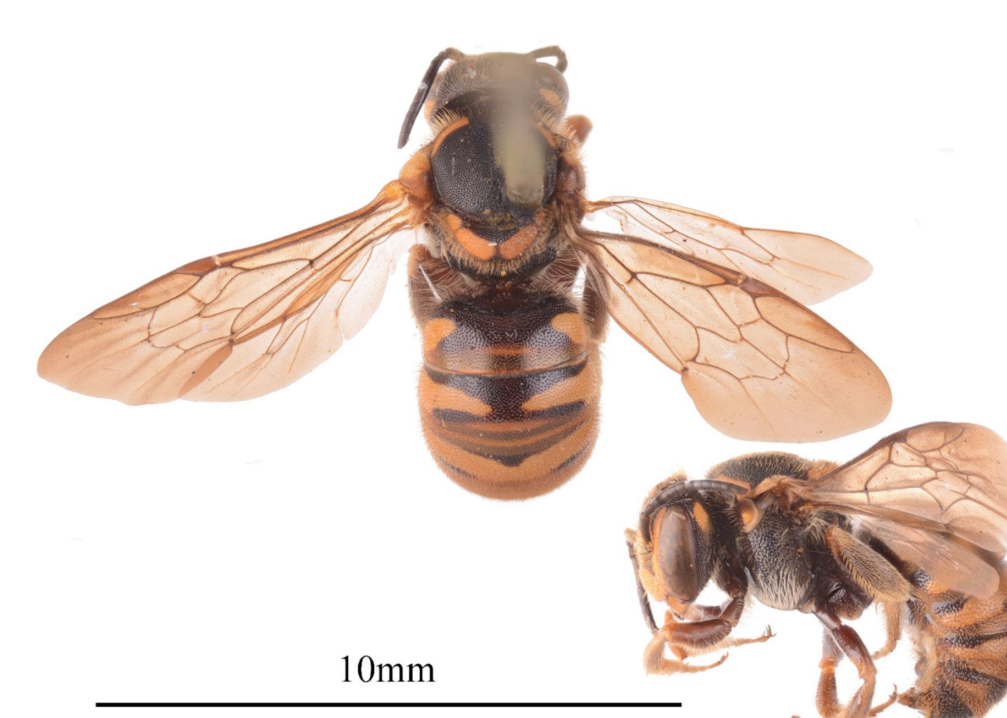


## Endemic Apidae Species



## The most rare Taiwan bee

- *Bathanthidium bifoveolatum* (Alfken 1937)
- 3 specimens from 1923



## Acknowledgements

Jessica Ware lab  
GBIF-Biodiversity Information Fund for Asia, data mobilization grant  
Society of Systematic Biologists Mini-Arts grant  
National Science Foundation Graduate Research Fellowship Program  
John Wang lab, TIGP internship, Academia Sinica  
Chi-Feng Lee, Taiwan Agricultural Research Institute  
Jing-Fu Tsai, Mei-Ling Chan National Museum of Natural Sciences  
David Reidi, Hou-Feng Li, National Chung Hsing University  
Insect Systematics lab, National Taiwan University



## References

- [1] Klein, et al. 2007. Importance of pollinators in changing landscapes for world crops. Proceedings of the Royal Society B.
- [2] Potts, et al. 2003. Linking bees and flowers: how do floral communities structure pollinator communities? Ecology.
- [3] Orr, et al. 2021. Global patterns and drivers of bee distribution. Current Biology.
- [4] Zattara, Aizen. 2021. Worldwide occurrence records suggest a global decline in bee species richness. One Earth.
- [5] Niu, et al. 2019. Overview of the genus *Trachusa* Panzer (Hymenoptera: Apoidea: Megachilidae: Anthidiini) from China with description of three new species. Zootaxa.
- [6] Kasparek. 2017. Resin bees of the anthidiine genus *Trachusa*. Identity, taxonomy, distribution, and biology of old world species. Entomofauna.

