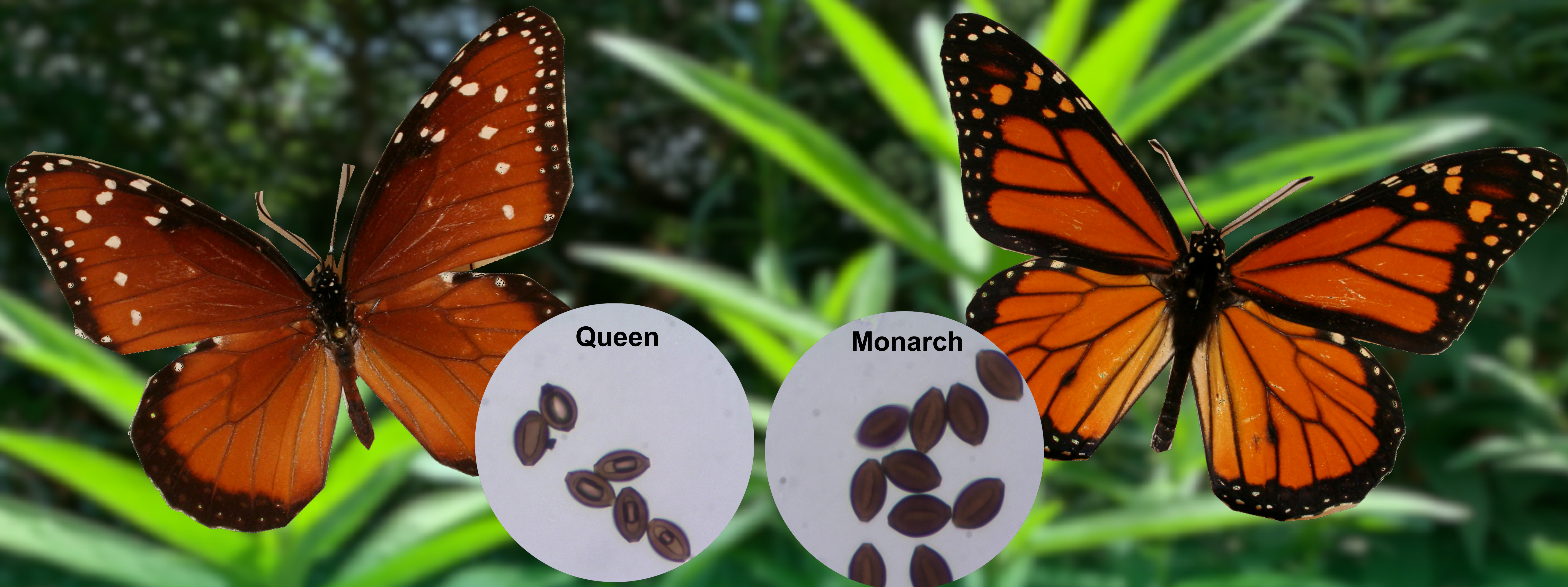


Royally Split: Morphological divergence of parasites in milkweed butterflies

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Introduction

- *Ophryocystis elektroscirrha* (OE) is a protozoan parasite in Monarchs (*Danaus plexippus*). Same or similar OE-like parasites have been found in Queens (*D. gilippus*) and other *Danaus sp.*
- Past experiments provided evidence of parasite specificity on natal host species via lower infection rates on novel hosts.

Questions

- Does spore morphology of OE and OE-like parasites differ across *Danaus* species?
- How do host and environmental factors affect spore morphology?

Museum Analysis

Methods

- Spores from 5 *Danaus* species with OE-like spores were sampled.
- Spore area, aspect ratio (length/width), hue, and darkness were measured.

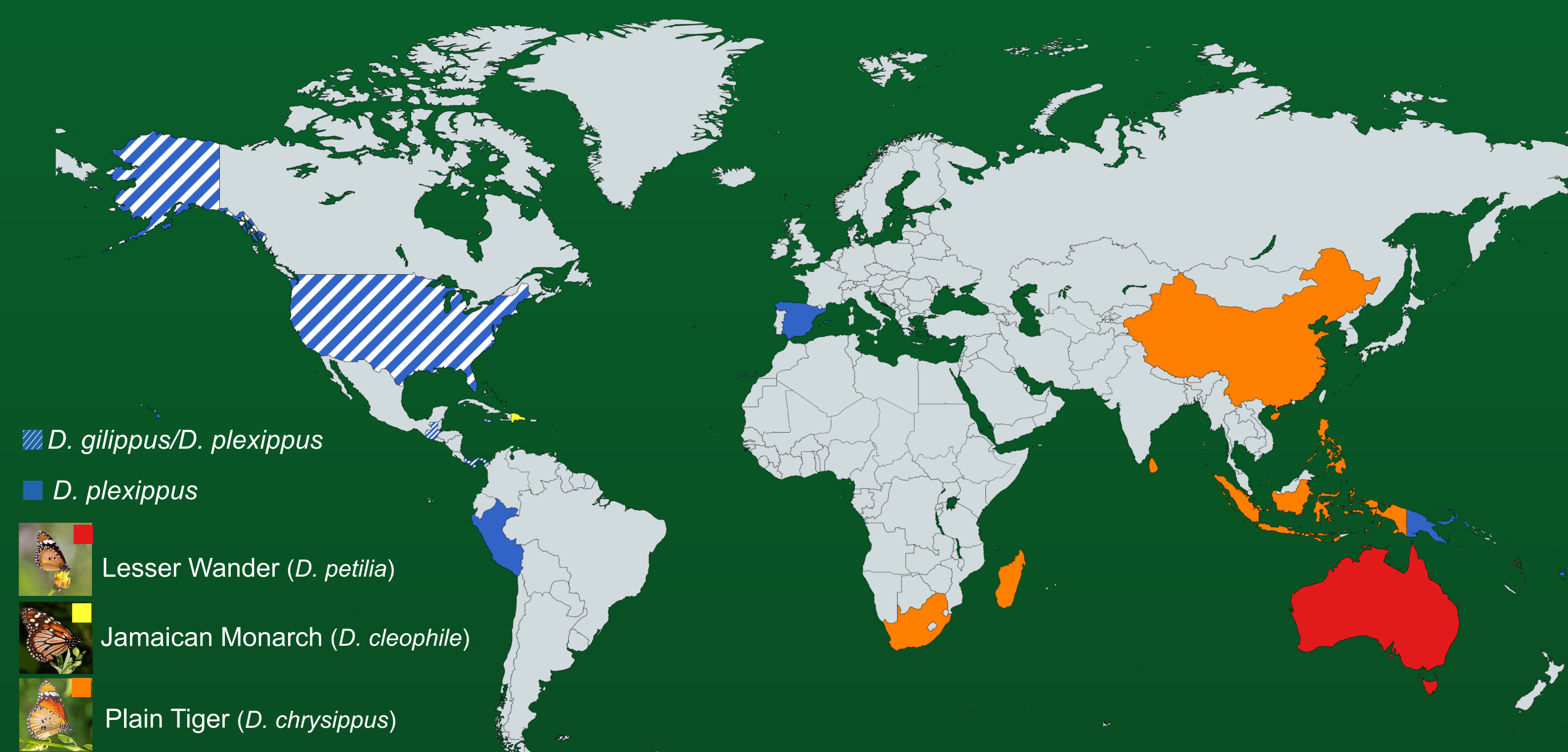


Fig. 1 | Countries of origin for OE/OE-like positive *Danaus*

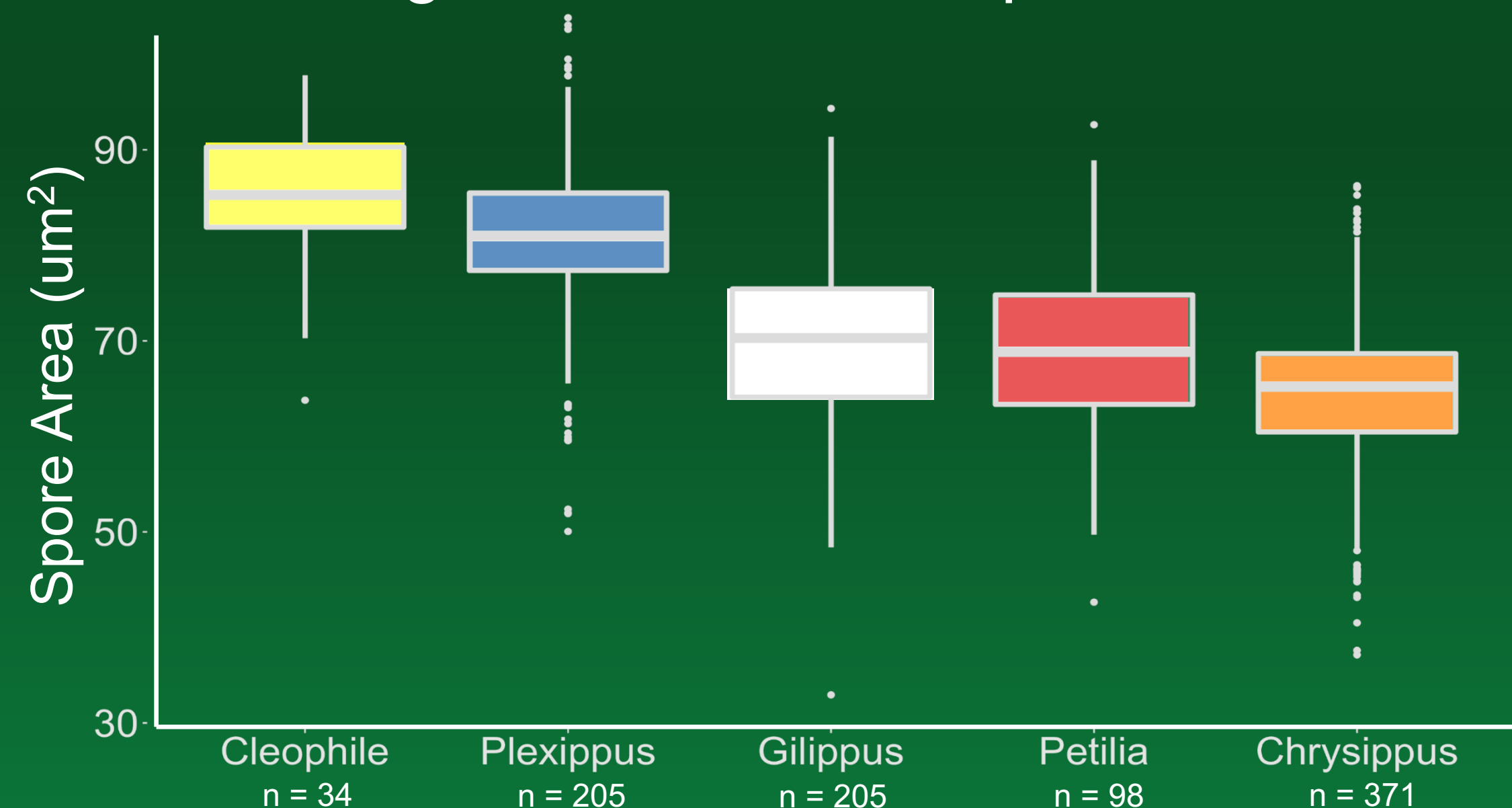


Fig. 2 | OE/OE-like spore size variation across *Danaus* species

Cross Infection Experiment

Methods

- Monarch and Queens fed on tropical (T) and swamp (S) milkweed plants and were cross-infected with OE or OE-like spores, Fig 3. (n = 50 per group, N = 600)

	Monarch Host	Queen Host
Monarch Parasite	T S	X
Queen Parasite	T S	T S

Fig. 3 | Host, parasite factorial design

Measurements

- Wing area, orange hue, black density of wing, and spore load of butterflies were measured. (n = 48)
- Spore area (μm^2), aspect ratio, darkness, and hue of parasites were measured.

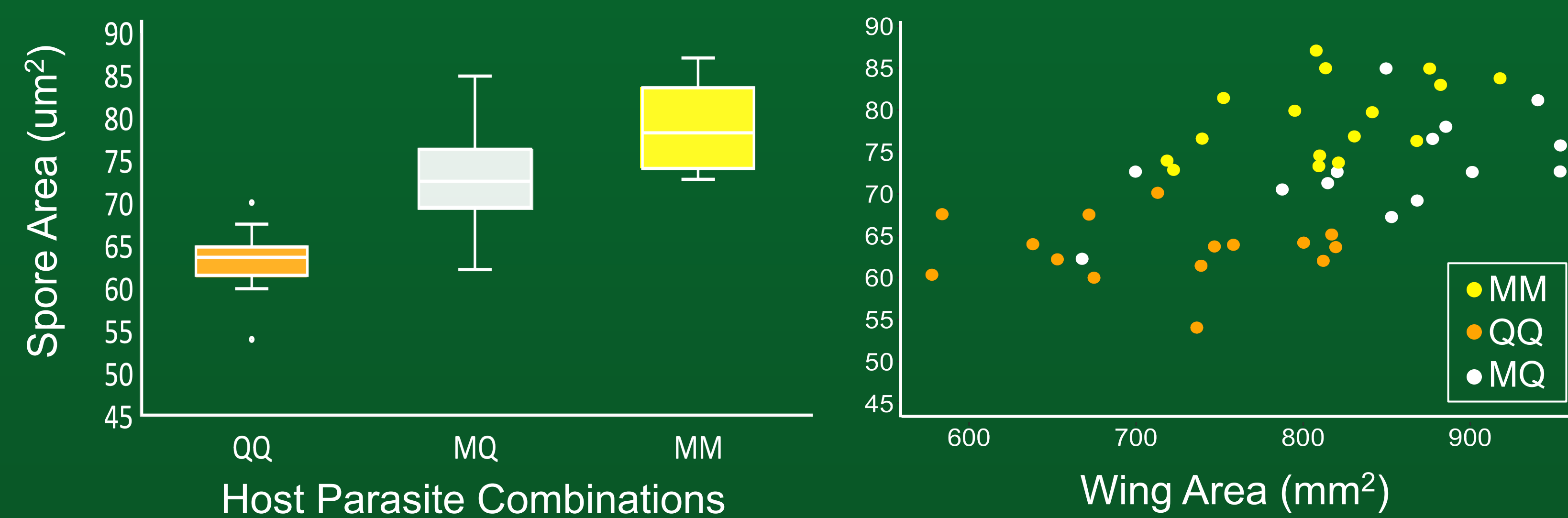


Fig. 4 | Spore area across groups Fig. 5 | Wing area by spore load

Conclusion

- Parasites from Jamaican Monarchs (*D. cleophile*) and Common Monarchs (*D. plexippus*) are the **largest** across *Danaus* hosts.
- From our experiment, Monarch parasites infecting Monarch hosts produce the **largest spores**. Queen parasites infecting Queen hosts produce the **smallest spores**.
- Wing area is **positively correlated** with spore area for all host parasite combinations.
- Milkweed species had little effect on spore morphology.

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