

EXPLORING DIVERSIFICATION OF AN EXOTIC ANT SPECIES ACROSS THE GALÁPAGOS ISLANDS

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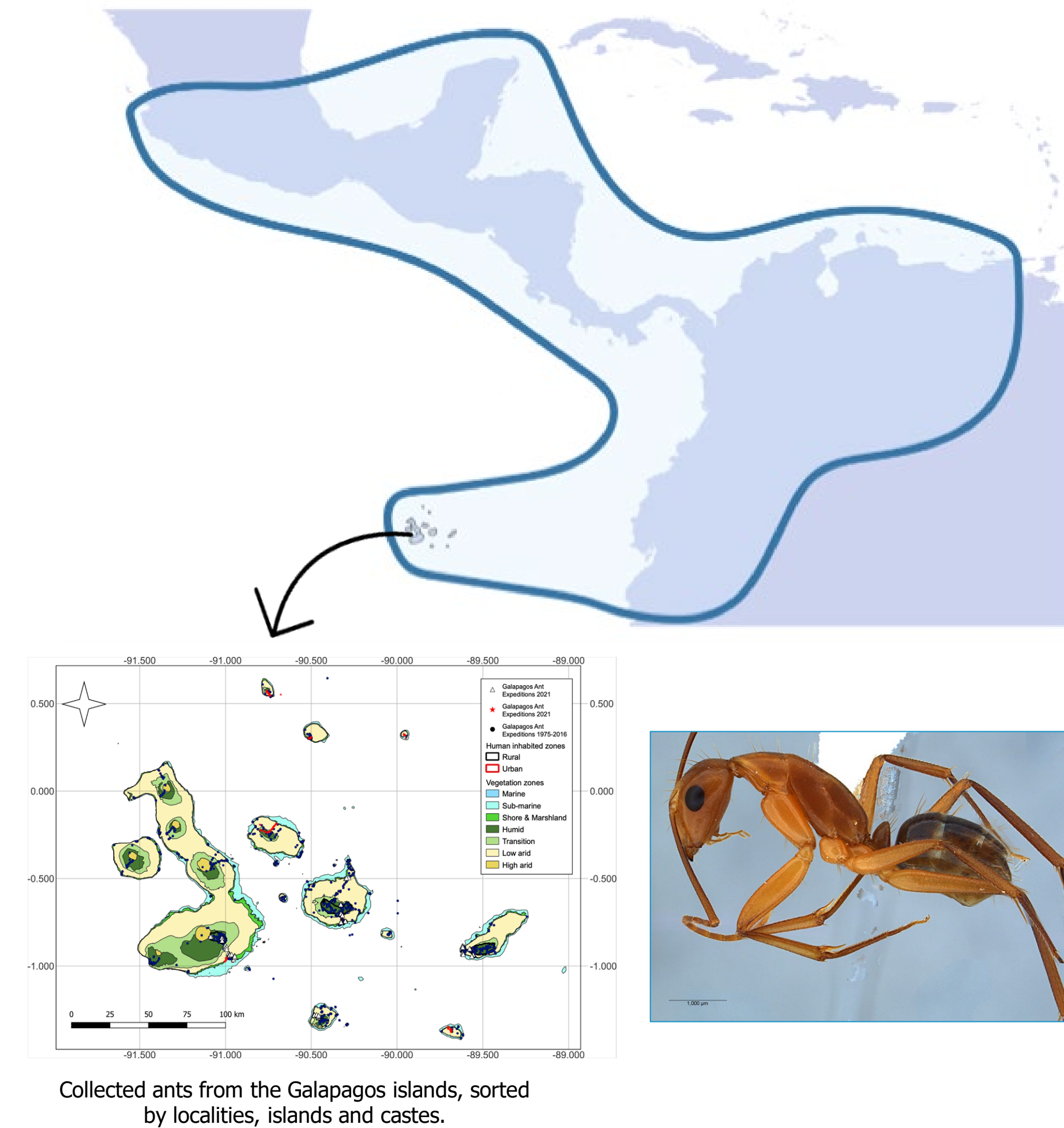
INTRODUCTION

Background:

Geographic isolation results in varying environments that impose different selective pressures on populations, leading to divergent adaptations and ultimately driving the process of adaptive radiation and speciation [1]. Morphological and genetic traits reflect the ecology and evolutionary process of a species [2].

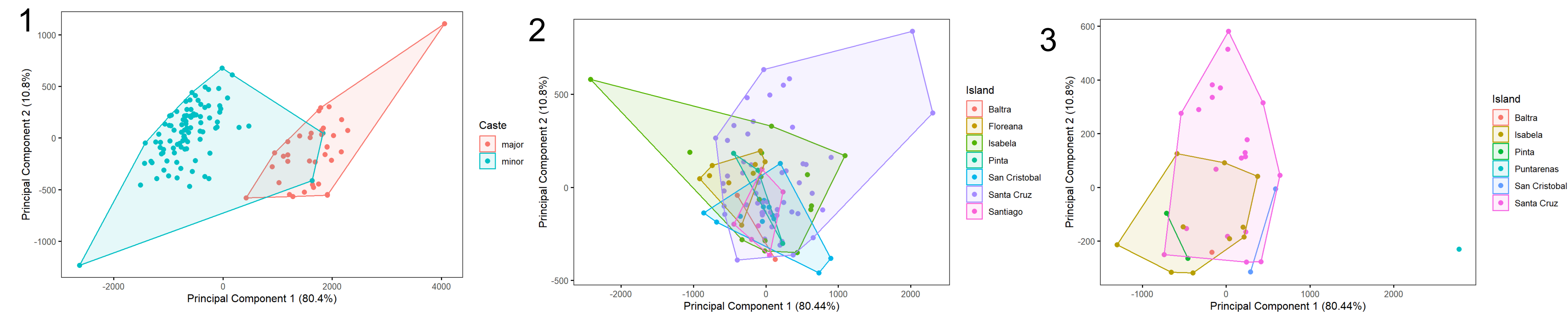
Objective:

To explore the morphology and genetics of an invasive ant species that is driving down populations of native ant species in the Galápagos Islands.



RESULTS

Populations of *C. zonatus* are morphologically similar across islands

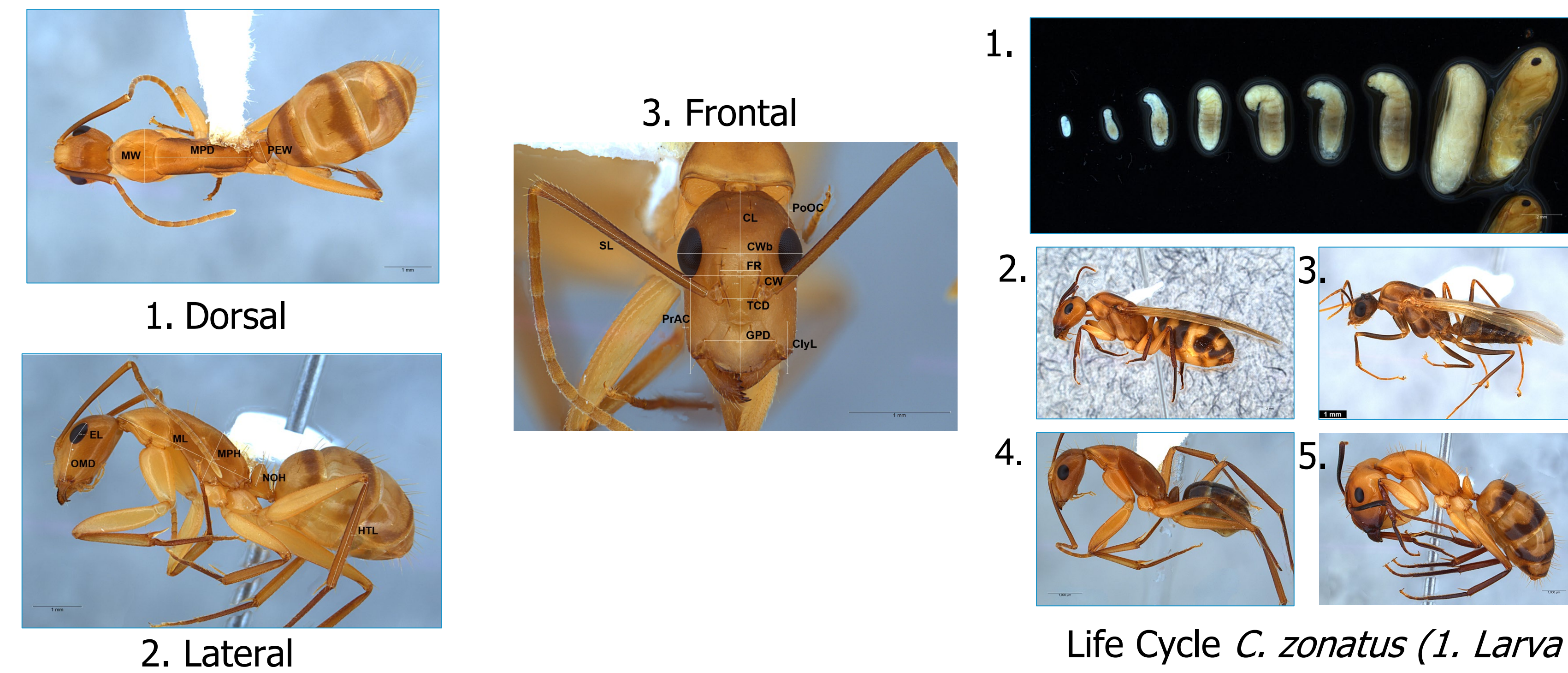


Principal component analysis plots illustrating high morphological similarity across 1. Majors vs Minors. Morphospace of major and minor castes converged regardless of distribution; 2. Minors grouped by islands; 3. Majors.

METHODS

Part 1: Morphological Characterization

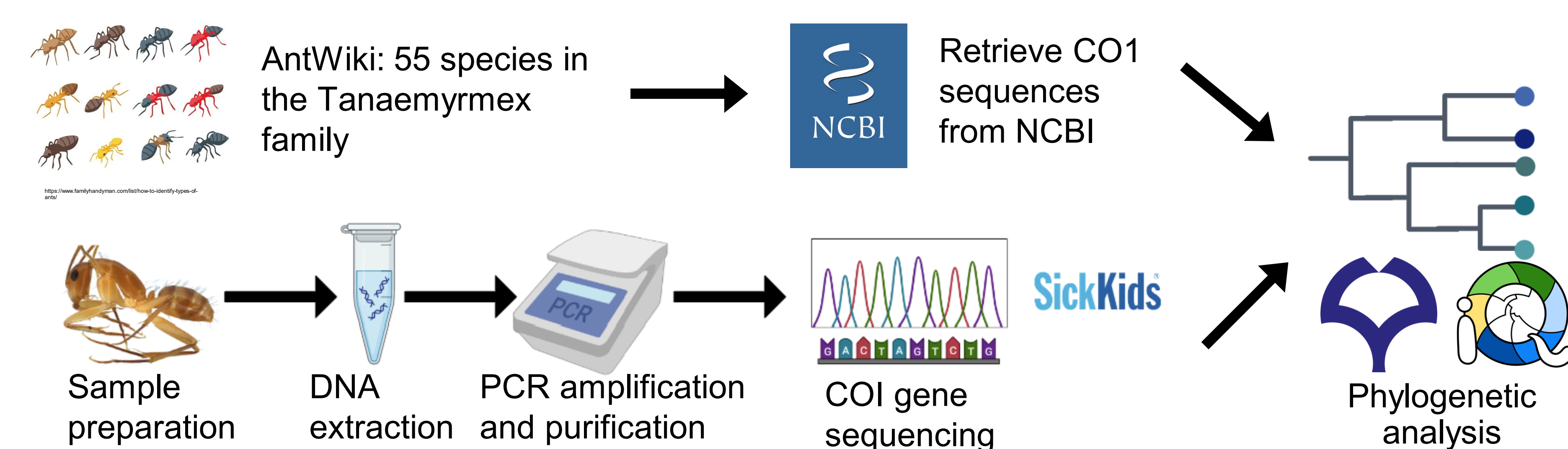
19 measurements using Leica M205A stereomicroscope with Leica LAS X Software



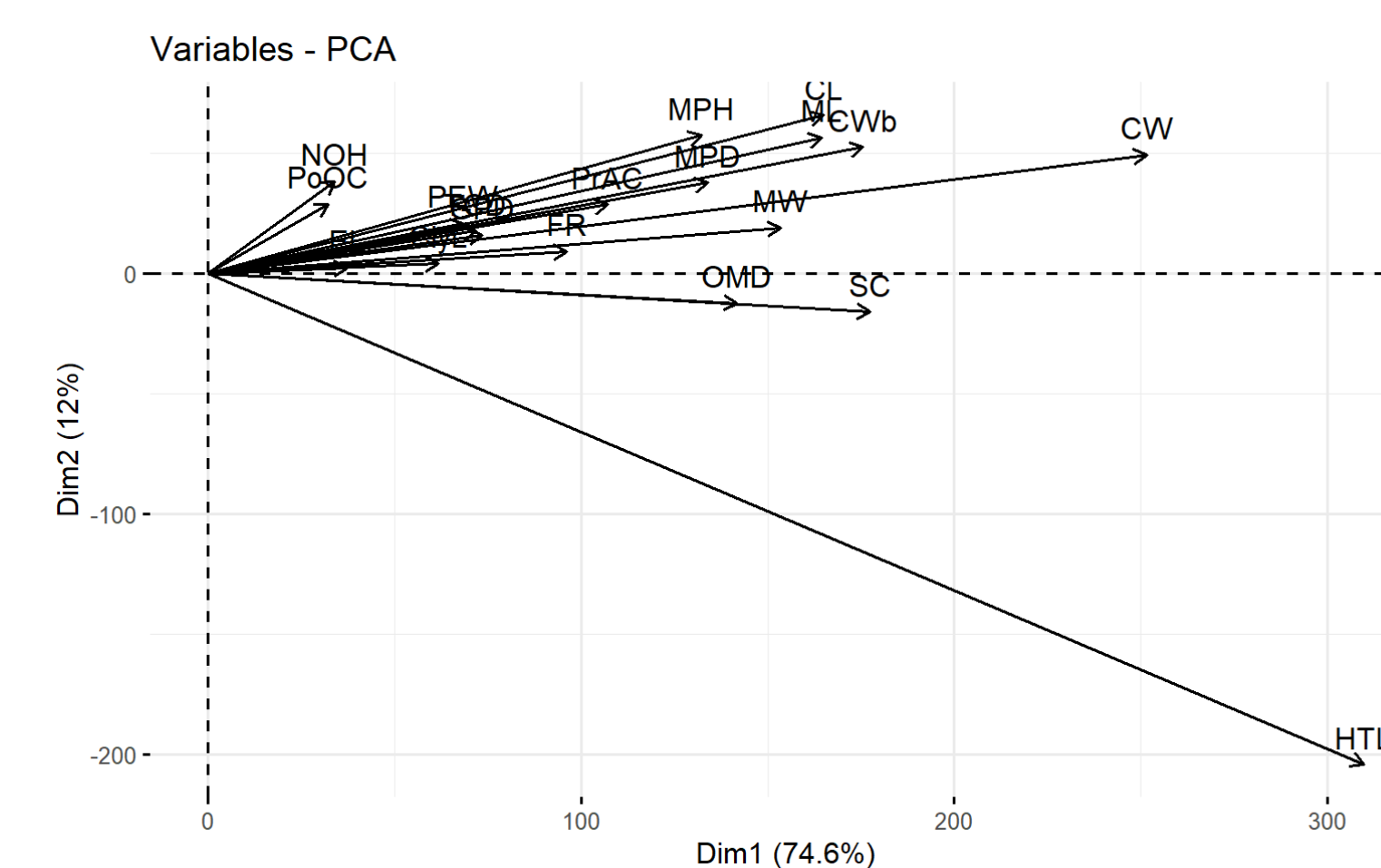
Life Cycle *C. zonatus* (1. Larva and pupa; 2. Queen; 3. Male; 4. Minor worker; 5. Major worker)

Part 2: Genetic Characterization

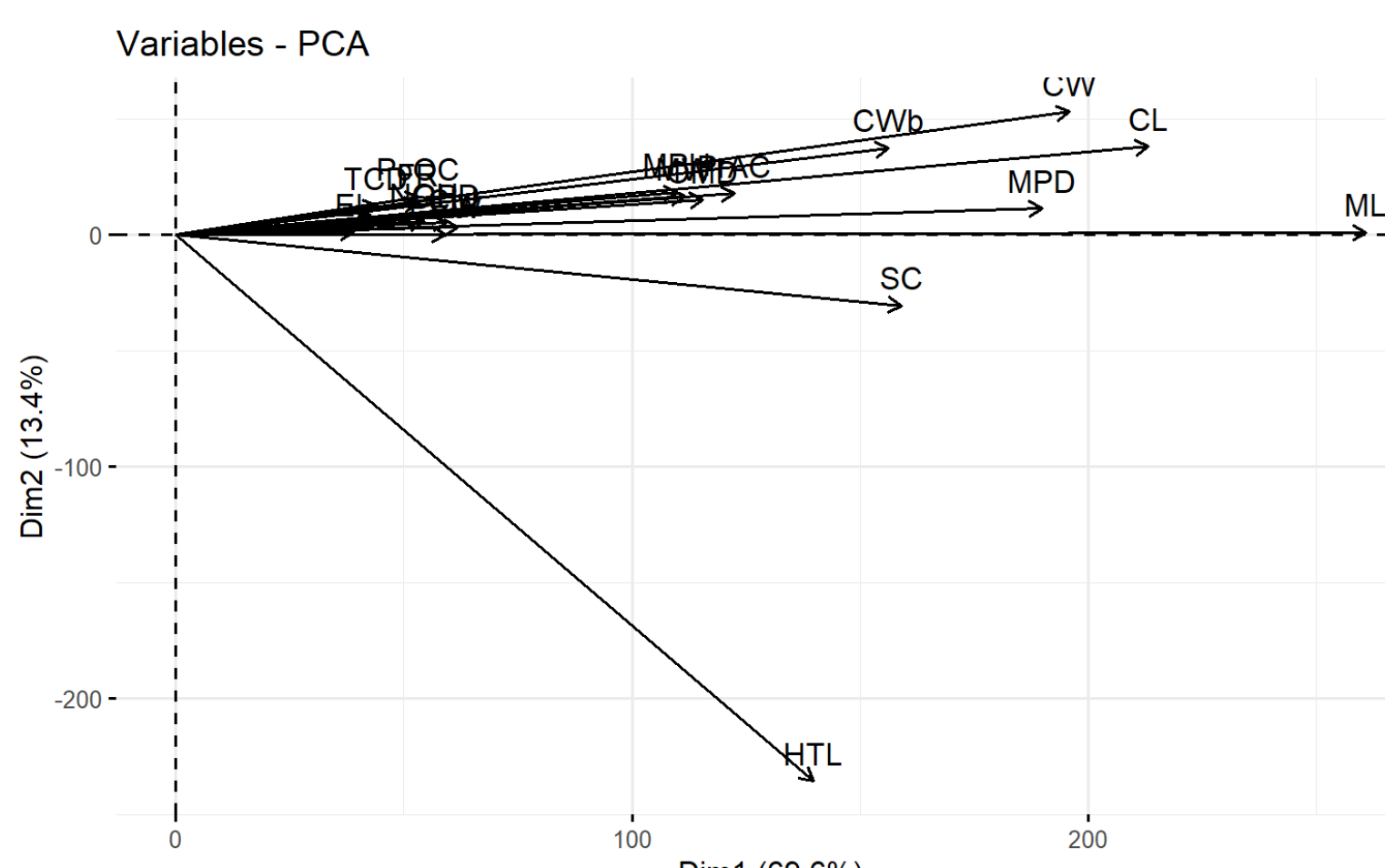
DNA Barcoding using COI



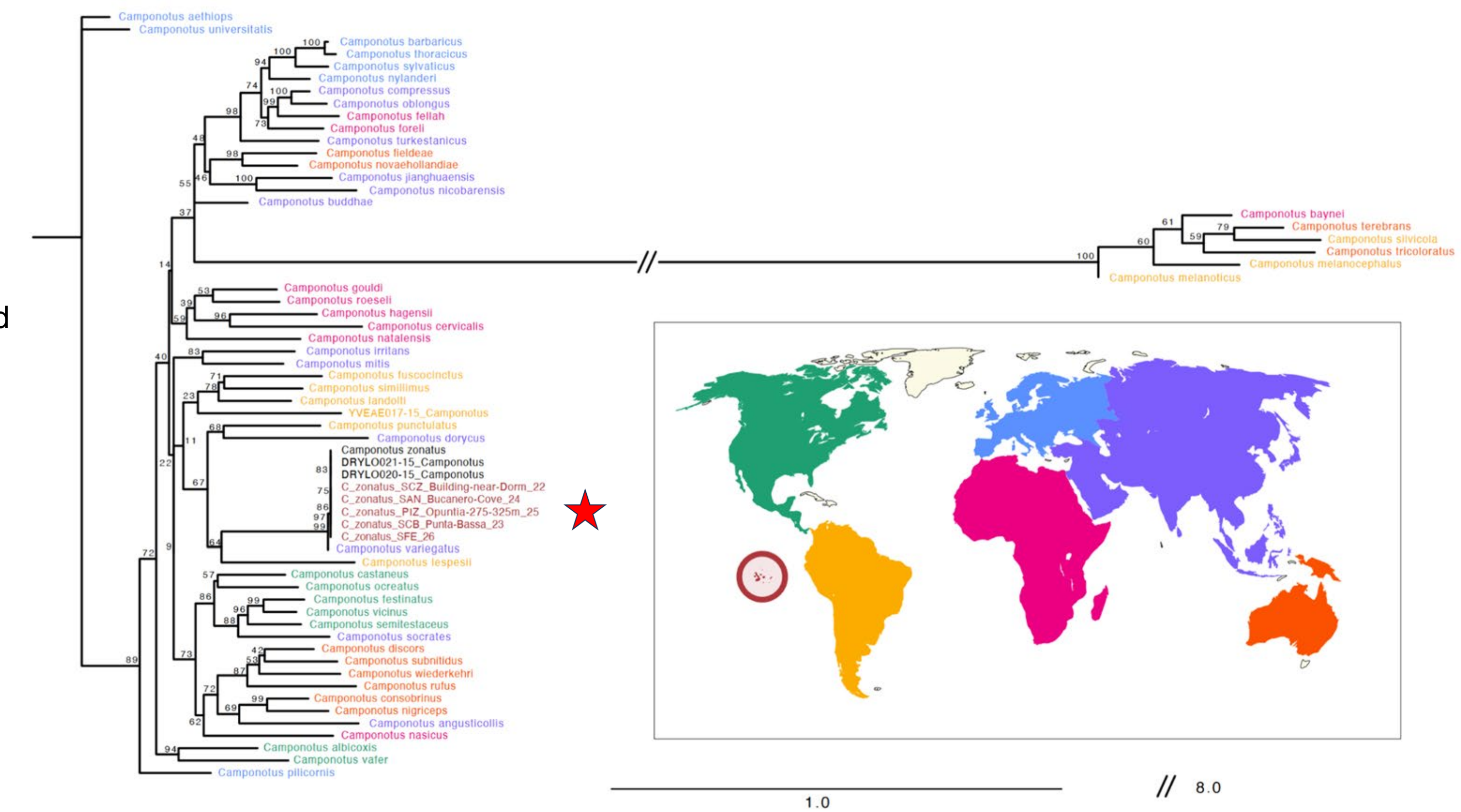
Populations of *C. zonatus* are genetically similar across islands



a. Correlation plot for major worker measurements. Maximum hind tibia length (HTL) demonstrate the highest variation in size and shape.



b. Correlation plot for minor worker measurements. Mesosoma length (ML) shows the highest variation in size; HTL shows the highest variation in shape.



Maximum likelihood (IQ-TREE) phylogeny of species in the subgenus *Taenamyrmex* based on the COI gene. Numbers near nodes are ultrafast bootstrap support values.

CONCLUSIONS AND DISCUSSION

There is high similarity in *C. zonatus* morphology across the archipelago which is coupled with genetic data showing little genetic variation of the CO1 gene, suggesting that *C. zonatus* is a huge panmictic population across the archipelago. This is in line with previous evidence showing that reduced genetic variation may promote invasive success by reducing intraspecific aggression in ants [3]. Additionally, this species was introduced to the Galápagos Islands less than 100 years ago which may not be long enough for speciation to occur. Future work will increase the sample size for some islands and explore variations not captured in morphology.

References:

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- Weiser MD and Kaspari 2006. Ecological morphospace of new worlds ants. 31: 131-142.
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