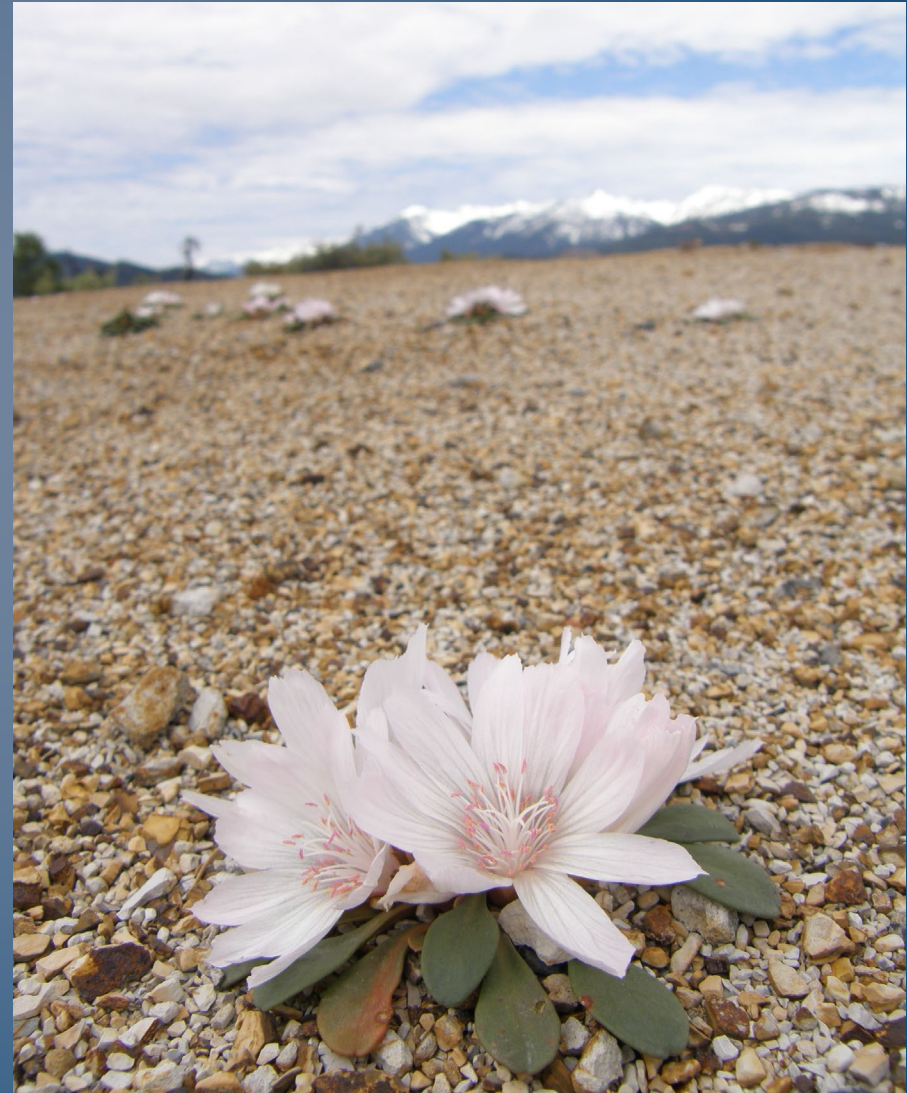


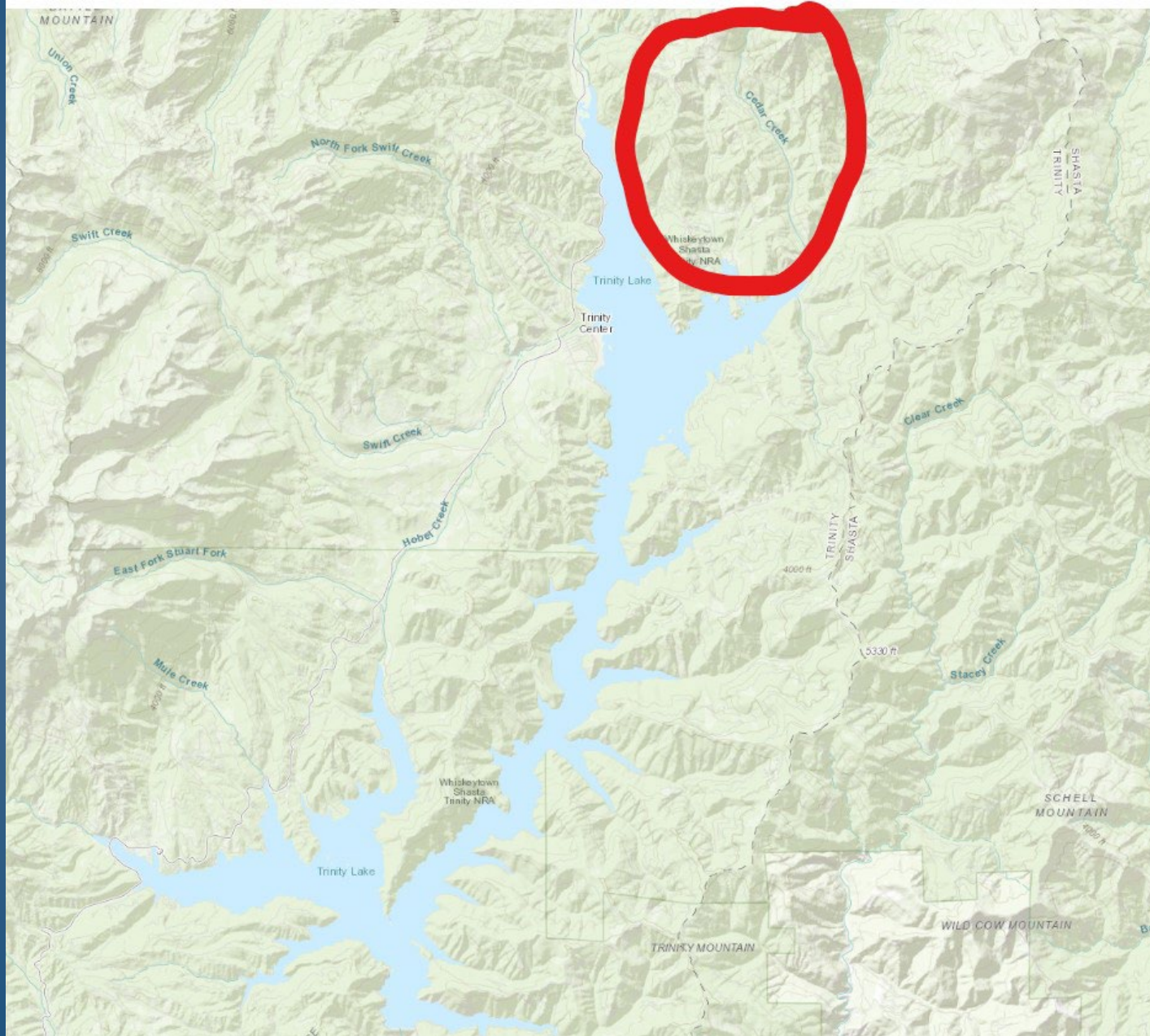
# A NEW LEWISIA FROM THE SOUTHEASTERN KLAMATH RANGES

JESSICA O'BRIEN, MATT GUILLIAMS,  
STEPHANIE PUENTES, LEN LINDSTRAND III

2024 Northern California Botanists Symposium  
8 January 2024



# THE STORY BEGINS..... JUNE 2010





Silene salmonacea

## OPEN HABITATS



Erythronium citrinum var.  
roderickii



## TJM Key

1' Sepals entire or not, not petal-like; stem no disjointing, bracts generally 2 or alternate on stem, not in ring (sect. *Oreobroma*)

3. Sepals 2 but seemingly 4 due to 2 sepal-like bracts immediately below calyx; stems 1-flowered

4. Sepal margins entire- San Bernardino Mountains, Peninsular Ranges.....*L. brachycalyx*

4' Sepal margins gland-toothed.....*L. kelloggii*



LEWISIA SP. NOV.



LEWISIA KELLOGGII



LEWISIA SACAJAWEANA



# 2011 START OF ISOZYME AND GENETIC WORK

Lewisia populations that were sampled as part of NFGEL *Lewisia sacajewiana* study (green symbols) and Trinity *Lewisia* study (yellow symbols).





### Principal Coordinates

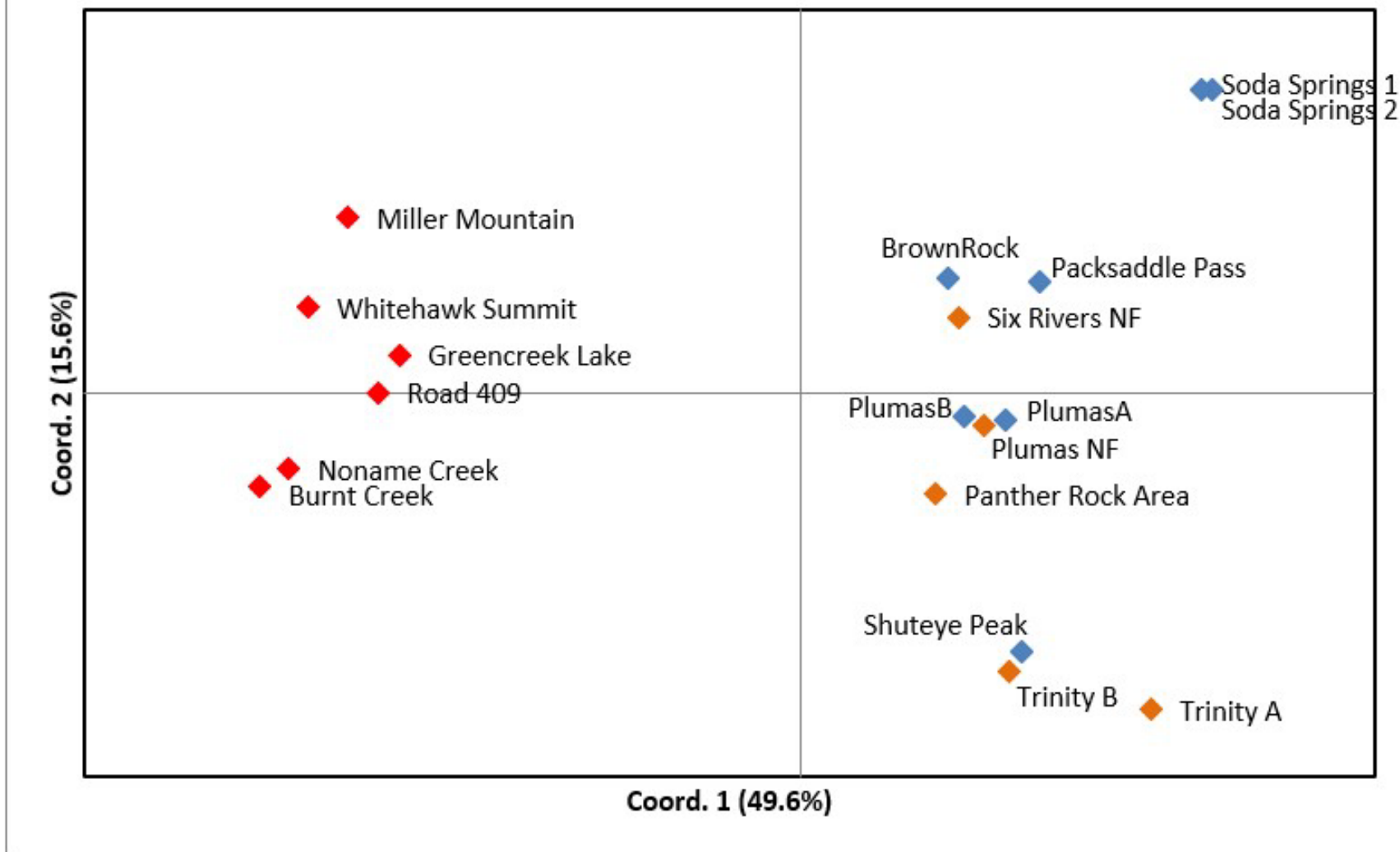


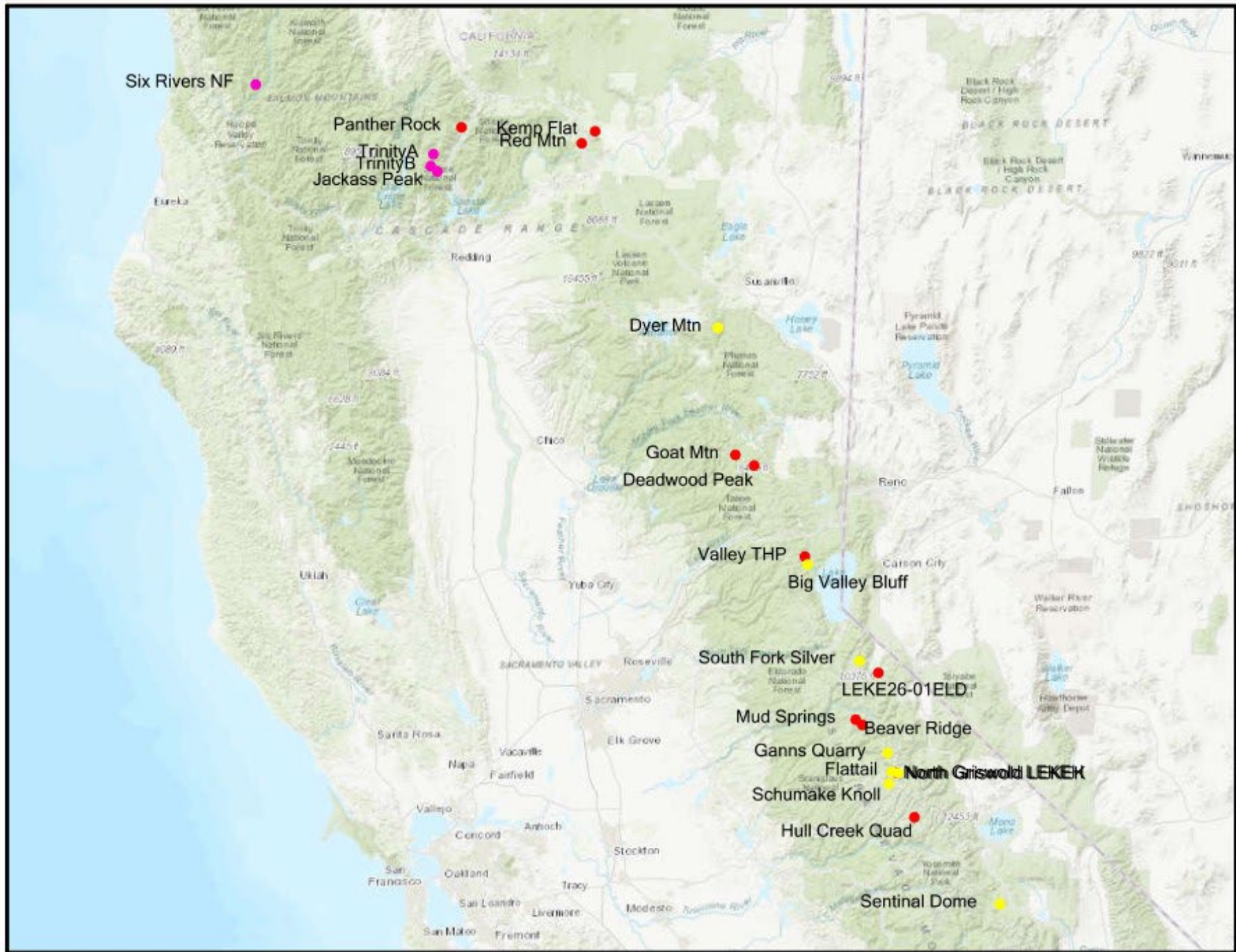
Figure 4. Principal coordinate analysis showing genetic relationships among 18 populations of Lewisia from NFGEL Projects 74 and 255. Each symbol represents one Lewisia population. Red symbols = Idaho Lewisia populations (Project 74); Blue symbols = California Lewisia populations (Project 74); Orange symbols = California Lewisia populations (Project 255)

# MORPHOLOGICAL STUDY

- Collections between 2012-2018
- Across the range of *Lewisia kelloggii*
- 22 Locations
- Sample size of 20 individuals per location
- 33 different measurements recorded on each individual.
- Genetic material collected and stored at NFGEL.
- Herbarium specimens collected at each location.



- LEKEH
  - LEKEK
  - Unknown
- World Topo Map



# UNIQUE FEATURES: TEETH AND GLANDS ON SEPALS AND BRACTS



Trinity Lewisia  
Entire to  
eglandular  
toothed sepals  
and bracts.



*Lewisia kelloggii*  
Glandular toothed  
sepals and bracts.

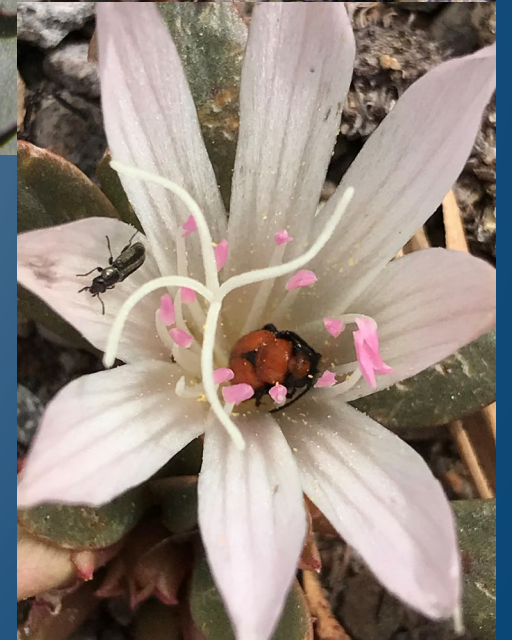
# UNIQUE FEATURES: STAMEN #, STYLE LENGTH, AND ANTHOR LENGTH



Trinity Lewisia



Lewisia kelloggii

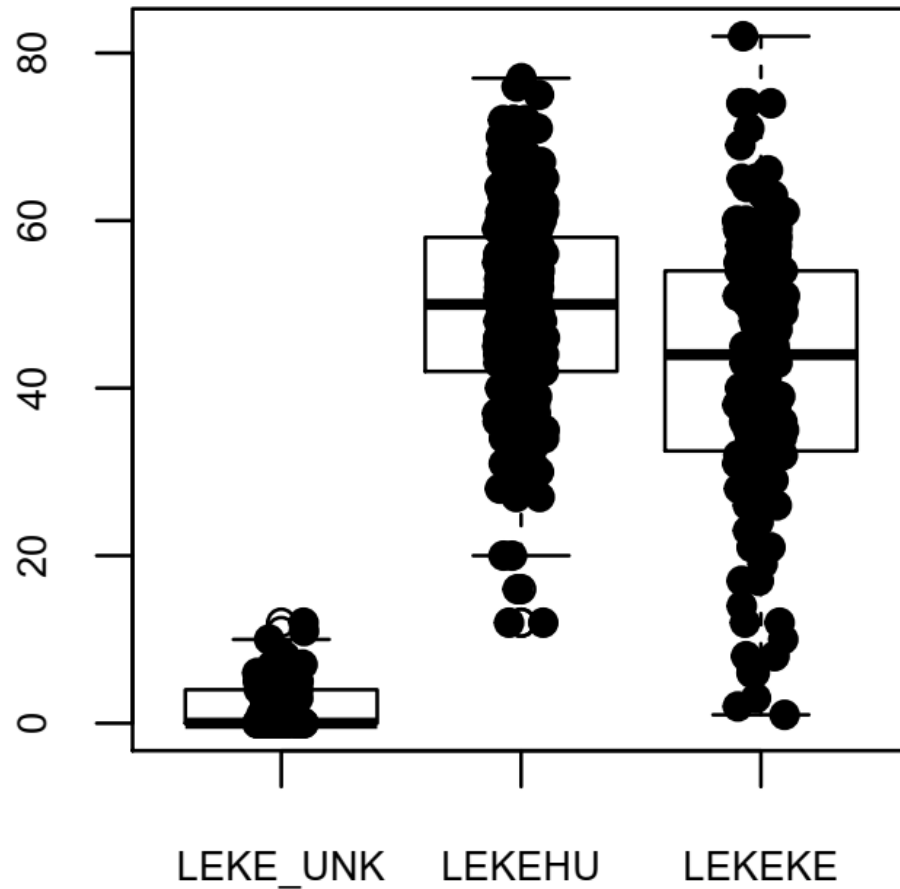


# SEVEN VARIATIONS THAT STRONGLY LOOK DIFFERENT BY TAXON

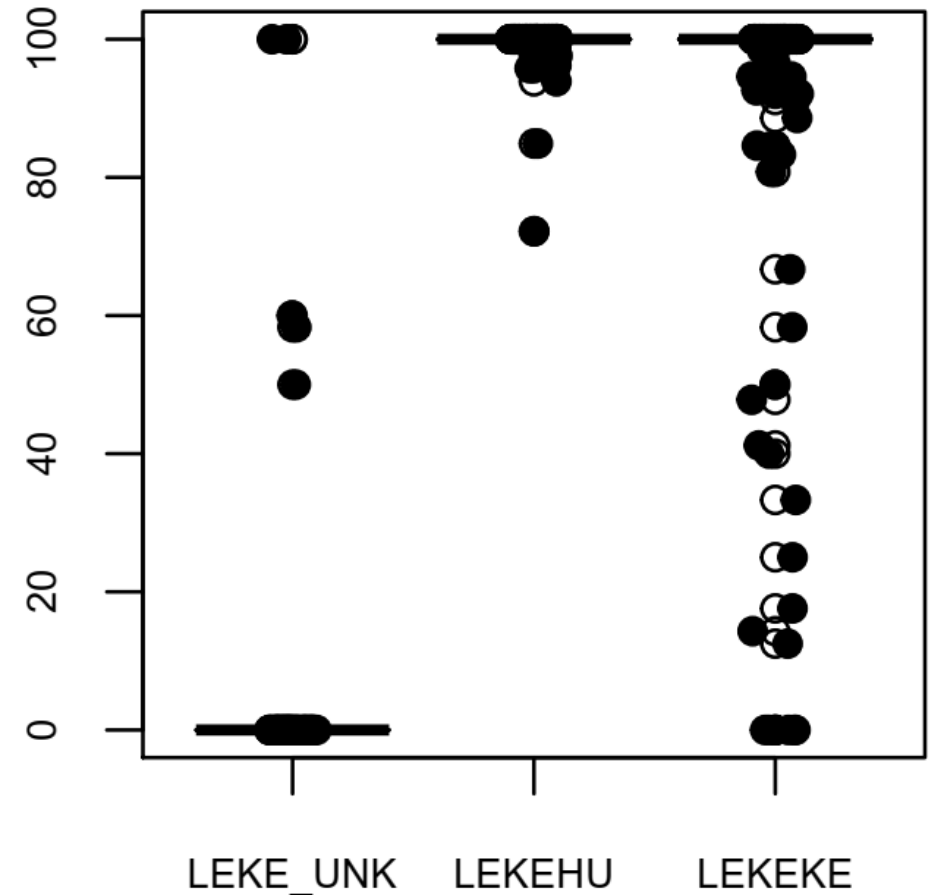
1. Bract Tooth Number
2. Bract Gland Percentage
3. Sepal Tooth Number
4. Sepal Gland Percentage
5. Stamen Number
6. Style Length
7. Anther Length

# BRACT VARIABLES

## Bract Tooth Number by taxon

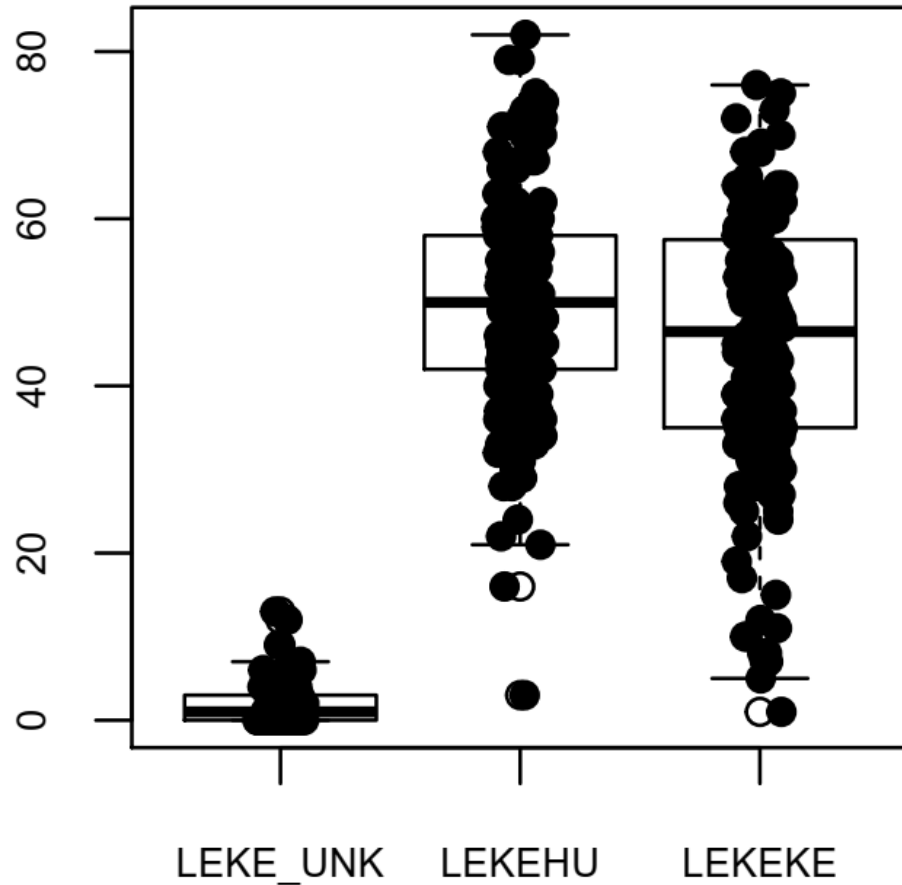


## Percent glandular teeth by taxon

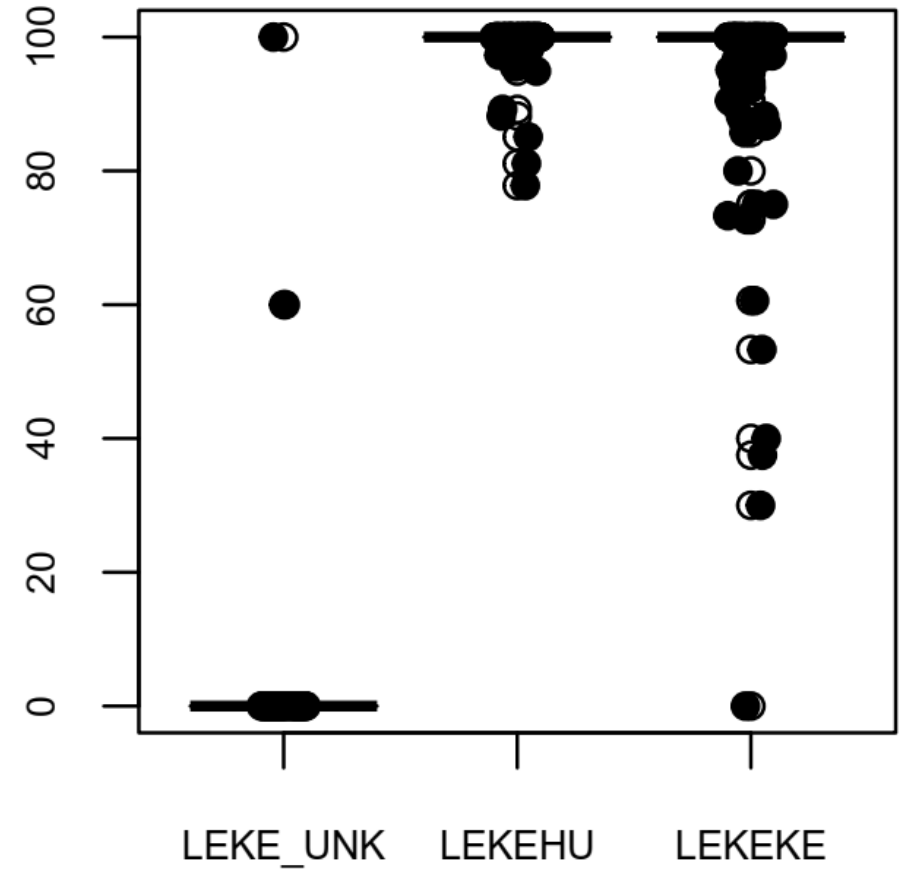


# SEPAL VARIABLES

## Sepal tooth number by taxon



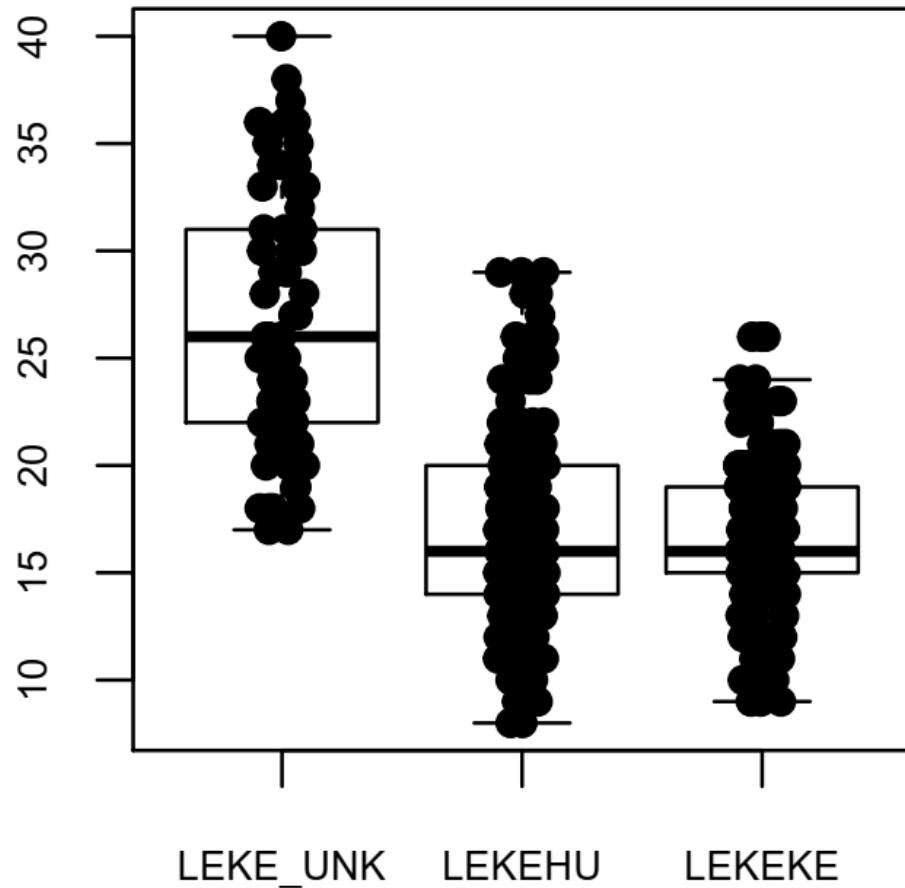
## Percent glandular teeth on sepal by taxon



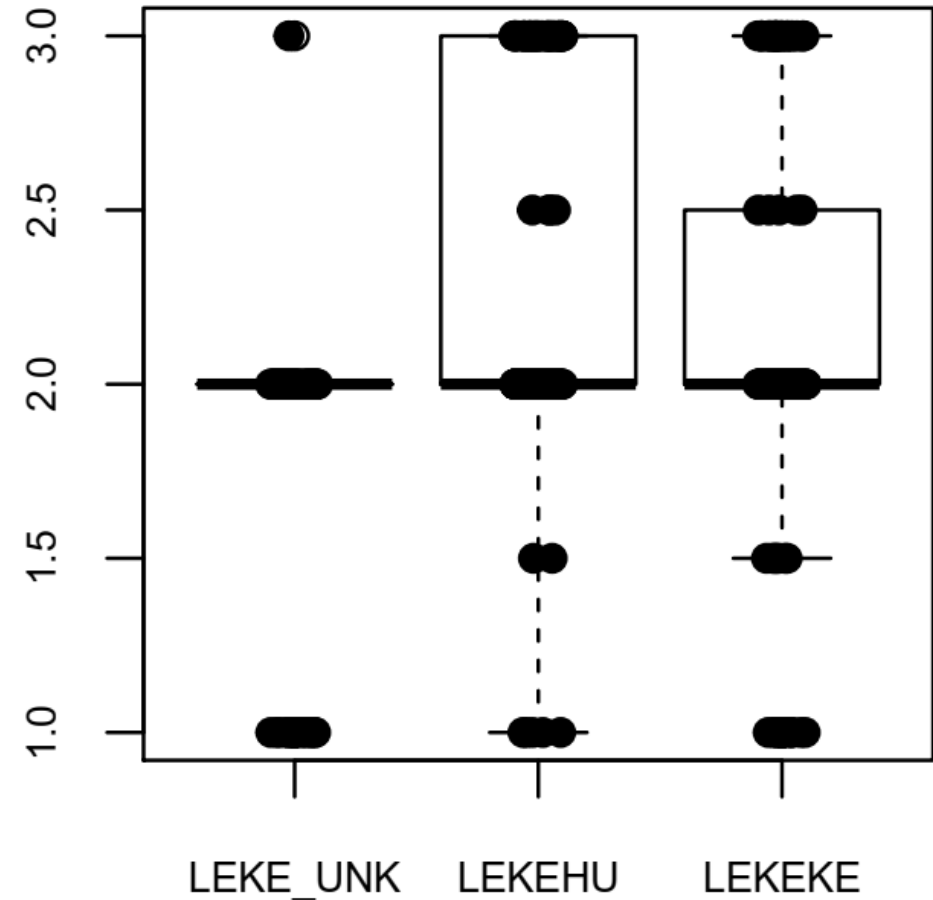


# STAMEN AND ANTHOR VARIABLES

## Stamen number by taxon

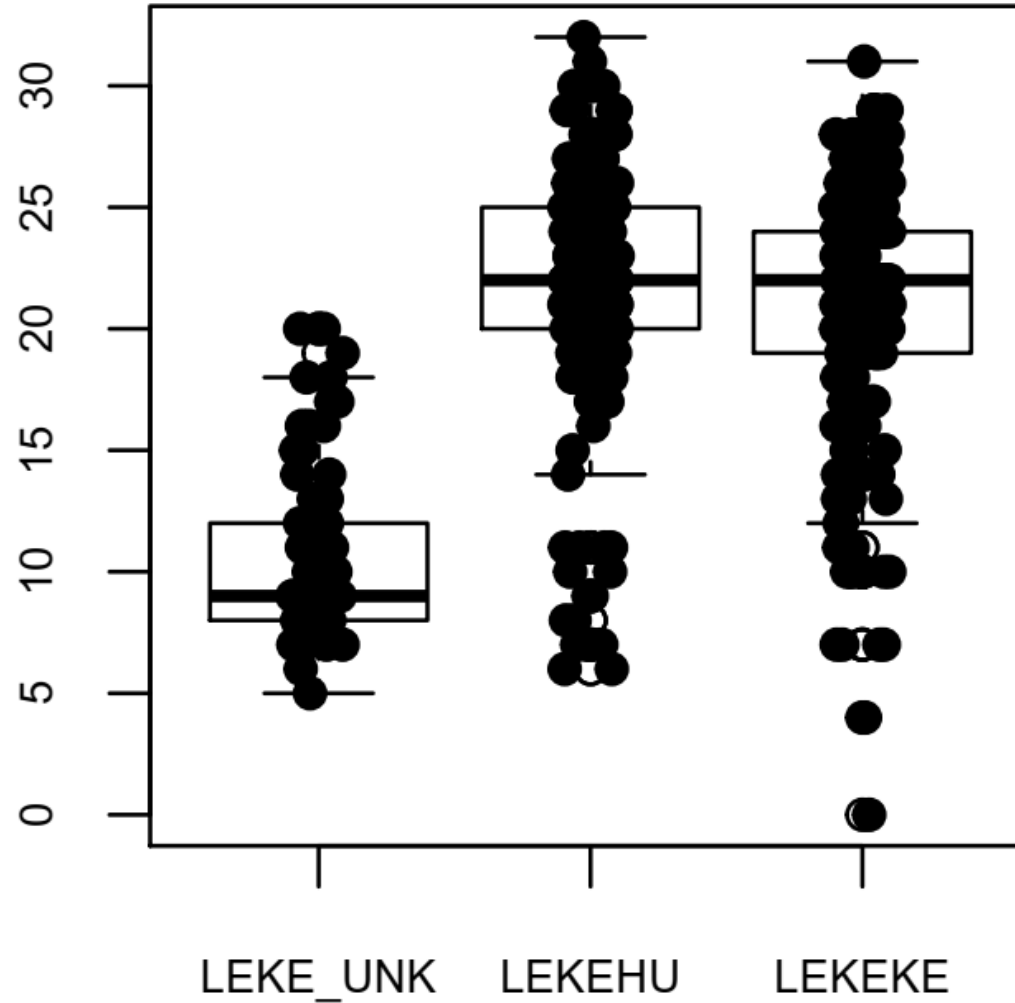


## Anther length (mm) by taxon

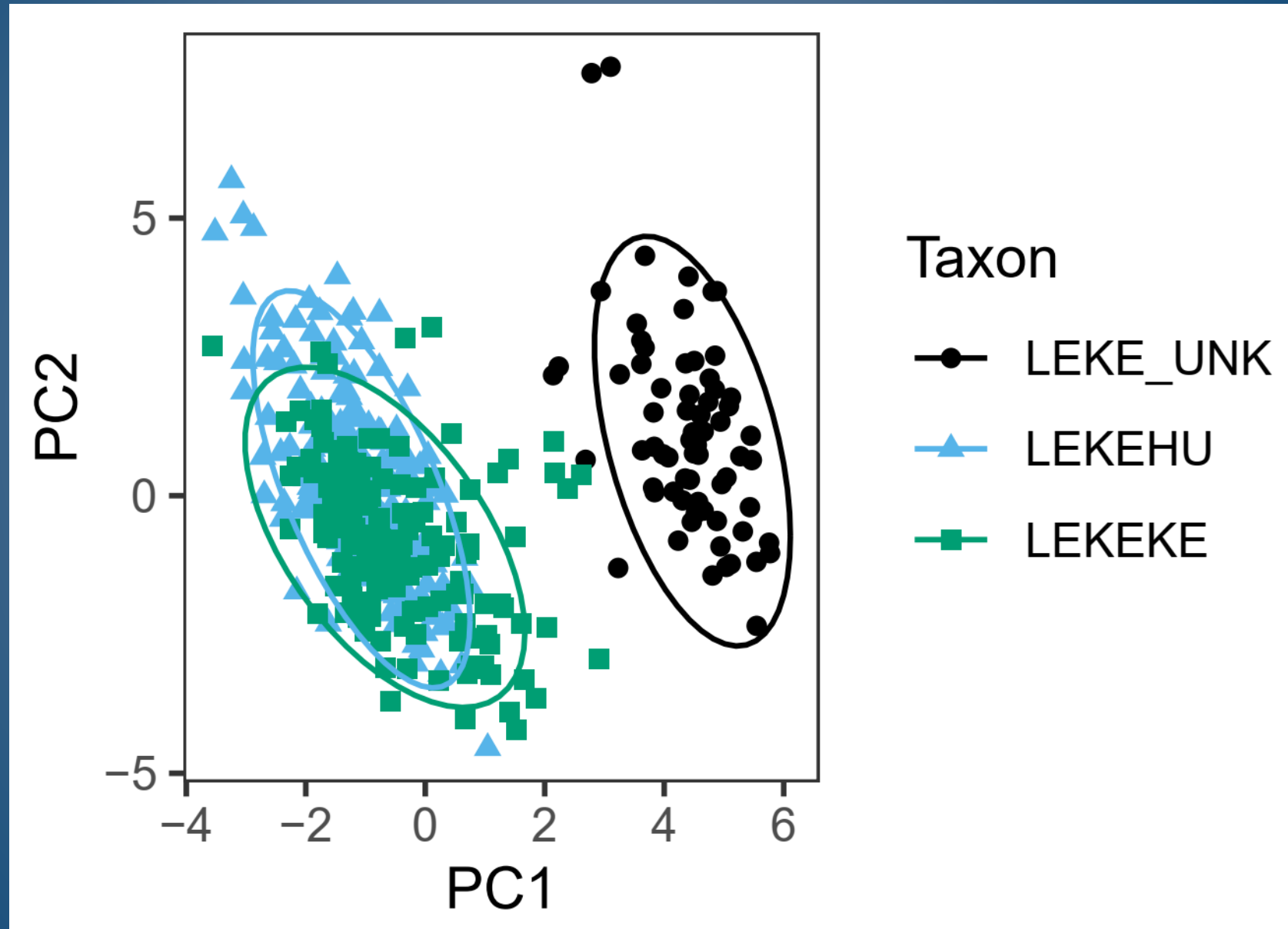


# STYLE VARIABLE

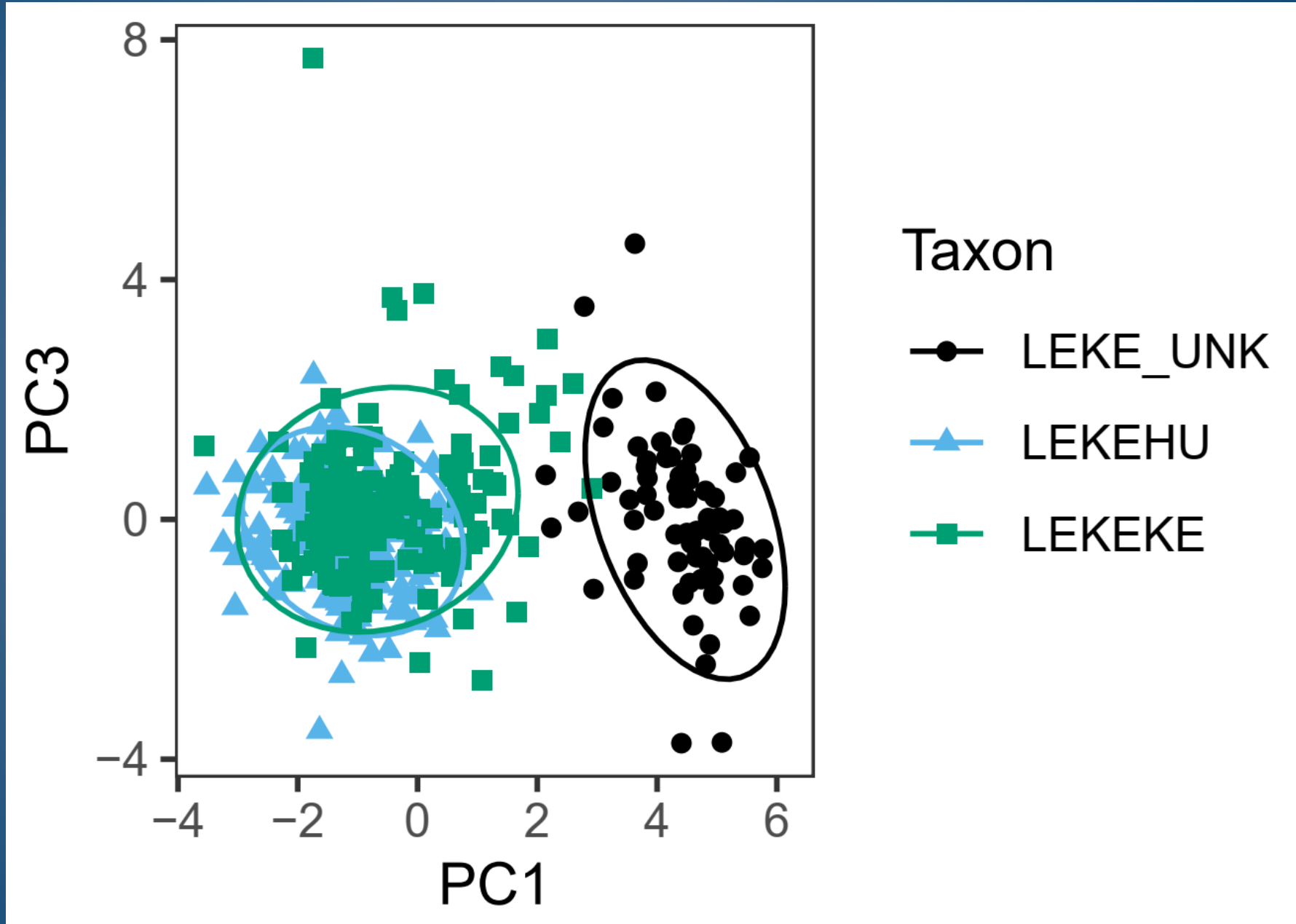
## Style length (mm) by taxon



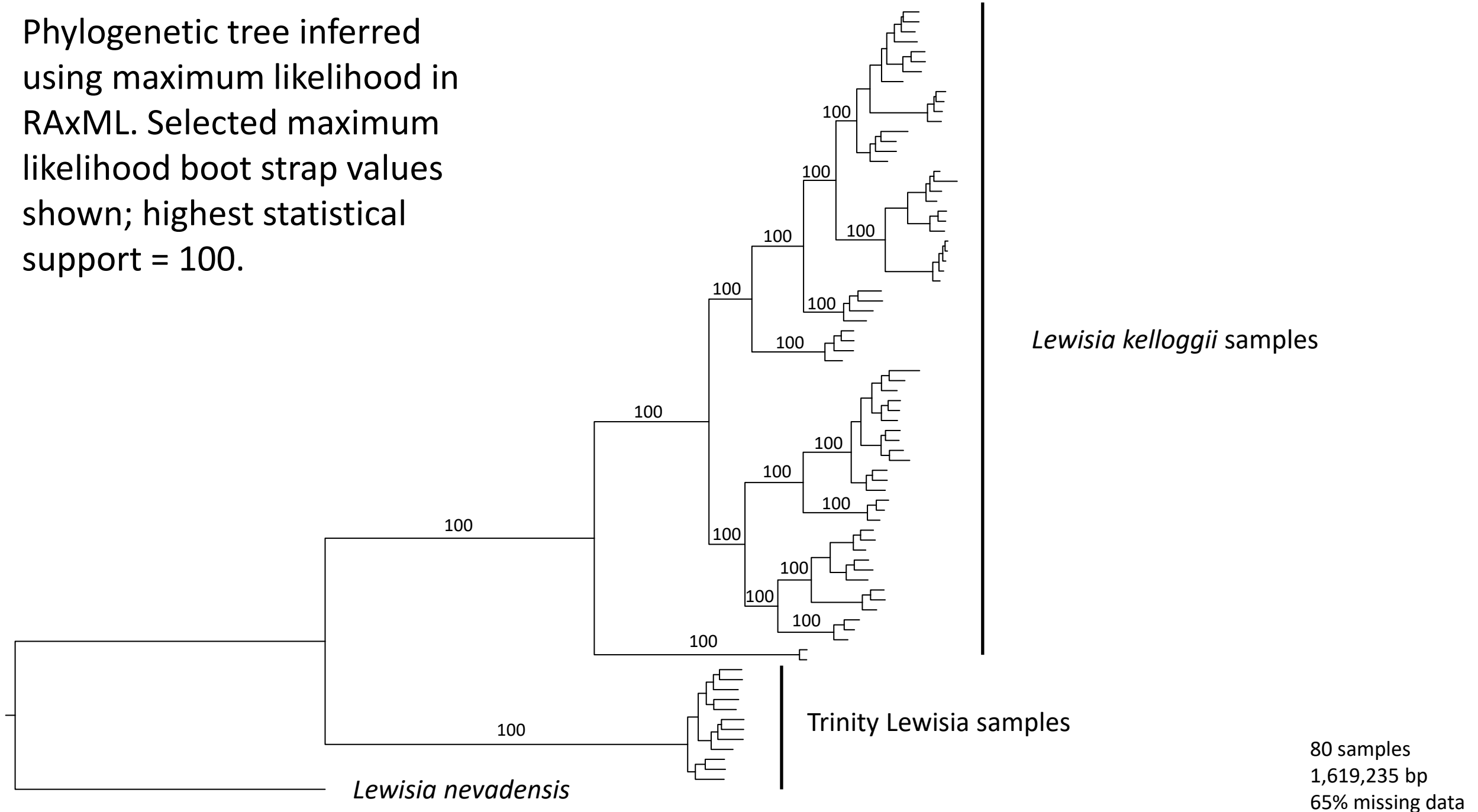
# FACTOR LOADING ALL VARIABLES IN PRINCIPAL COMPONENTS ANALYSIS



# FACTOR LOADING THE MAIN SEVEN VARIABLES



Phylogenetic tree inferred using maximum likelihood in RAxML. Selected maximum likelihood boot strap values shown; highest statistical support = 100.

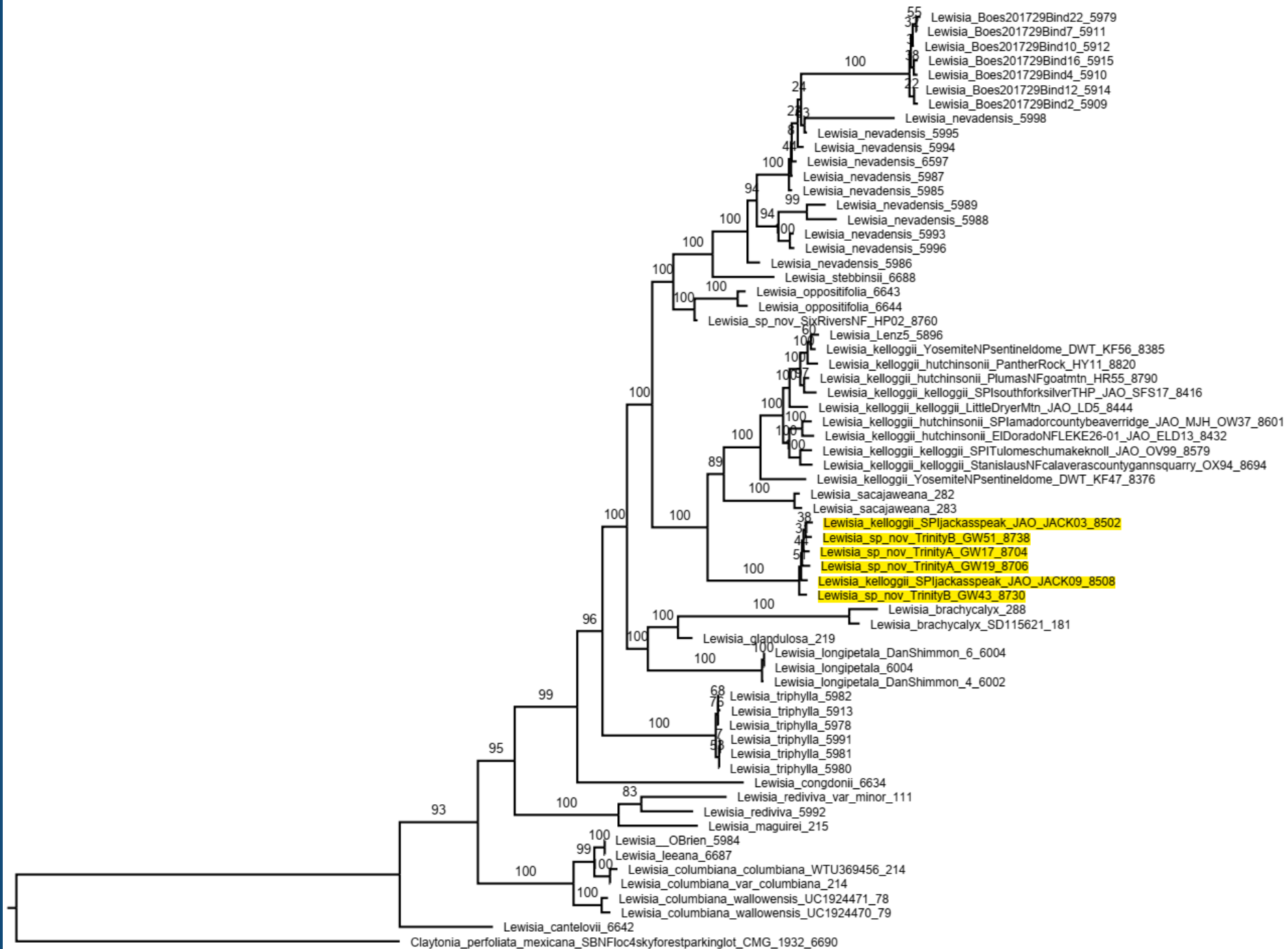


*Lewisia kelloggii* samples

Trinity Lewisia samples

*Lewisia nevadensis*

80 samples  
1,619,235 bp  
65% missing data



# PROPOSING: LEWISIA TAYLORII TRINITY LEWISIA

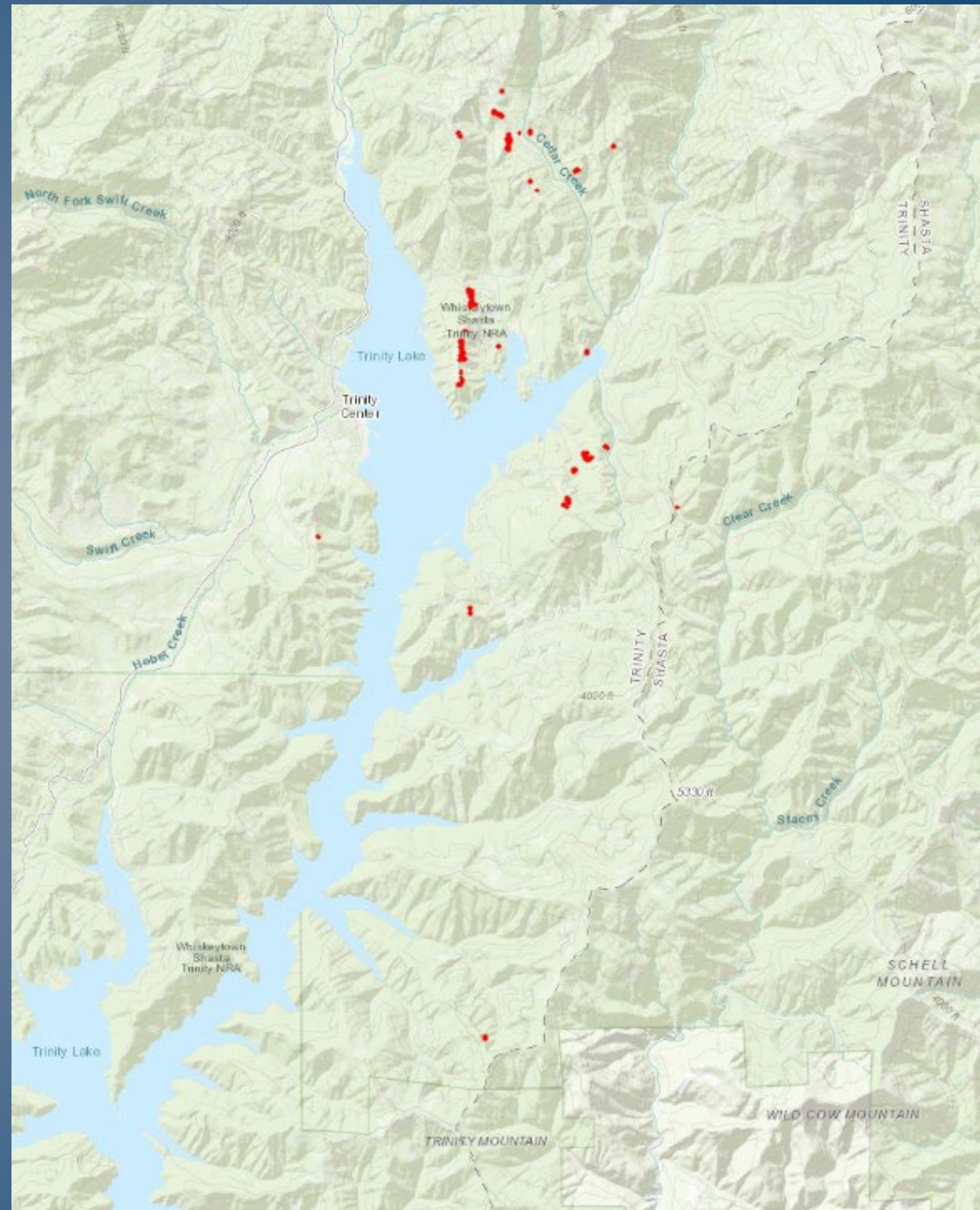
In honor of the late Dr. Dean Taylor.



# GEOGRAPHIC RANGE

Eastern Klamath Ranges of northeastern Trinity and northwestern Shasta counties.

Cedar Creek and Squirrel Creek in the North to Trinity Mountain in the South.





# BRAGDON SHALE FORMATION SOIL



# HABITATS







# PAST DISTURBED HABITATS (FUEL BREAKS, PLANTATIONS, SKID TRAILS, ROAD EDGES, WATER BARS)



# UNIQUE FEATURES RECAP

- Known only from the southeastern Klamath Ranges
- Bragdon Shale Formation Soil
- Bracts and sepals predominately entire and glandless
- Stamen #: 17-40 (larger than *L. kelloggii*)
- Style Length: 5-20 mm (shorter than *L. kelloggii*)
- Anther length: 1-2(3) mm (shorter than *L. kelloggii*)



THANK YOU TO THE MANY PEOPLE THAT  
HAVE HELPED WITH THIS PROJECT!

