CBC 2021 data visualization

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0. Introduction

a. Where'd the data come from?

The data presented below are observations from the Santa Rosa count on the 28th of December 2021 (FHJ, MH, AB) and the Cacao count on the 30th of December 2021 (FHJ, RVJ, MH, AB).

b. Organization

This document is set up to exclude all the code used to generate the figures and tables for ease of reading. If you are interested in the code and explanations of how it works, you can find it outlined here.

1. Basic information

a. Code

How many species did we see on each count? How many species did we see on both counts?

How many individual birds did we see (probably)? What was the proportion of observations that were heard vs. seen vs. both?

How many species did we see on both counts?

b. Outputs

How many species did we see on each count? How many species did we see on both counts?

We saw 85 at Murciélago, and 98 at Leiva.

Species observed

especie	murci	leiva
Tinamidae		
Thicket Tinamou	yes	no
Cracidae		
Crested Guan	no	yes
Columbidae		

White-tipped Dove	yes	yes
Inca Dove	yes	no
White-winged Dove	yes	yes
Red-billed Pigeon	yes	no
Short-billed Pigeon	no	yes
Ruddy Ground Dove	no	yes
Cuculidae		
Squirrel Cuckoo	yes	yes
Groove-billed Ani	yes	yes
Caprimulgidae		
Common Pauraque	yes	yes
Lesser Nighthawk	yes	no
Nyctibiidae		
Northern Potoo	yes	no
Apodidae		
White-collared Swift	no	yes
Lesser Swallow-tailed Swift	no	yes
Trochilidae		
Blue-vented Hummingbird	yes	no
Cinnamon Hummingbird	yes	no
Ruby-throated Hummingbird	yes	no
Rufous-tailed Hummingbird	no	yes
Stripe-throated Hermit	no	yes
Scaly-breasted Hummingbird	no	yes
Rallidae		
Rufous-necked Wood-Rail	yes	no
Burhinidae		
Double-striped Thick-knee	yes	no
Charadriidae		
Wilson's Plover	yes	no
Scolopacidae		
Spotted Sandpiper	yes	no
Whimbrel	yes	no
Willet	yes	no
Solitary Sandpiper	no	yes
Laridae		
Royal Tern	yes	no
Ciconiidae		
Wood Stork	yes	yes
Fregatidae		
Magnificent Frigatebird	yes	no
Pelecanidae		
Brown Pelican	yes	no

Ardeidae		
Cattle Egret	yes	yes
Little Blue Heron	yes	no
Green Heron	yes	no
Great Egret	yes	yes
Snowy Egret	yes	no
Bare-throated Tiger-Heron	yes	yes
Tricolored Heron	yes	no
Great Blue Heron	yes	no
Threskiornithidae		
White Ibis	yes	no
Cathartidae		
Black Vulture	yes	yes
Turkey Vulture	yes	yes
Pandionidae		
Osprey	yes	no
Accipitridae		
Common Black Hawk	yes	no
Roadside Hawk	yes	yes
Short-tailed Hawk	yes	no
Great Black Hawk	yes	no
Strigidae		
Ferruginous Pygmy-Owl	yes	no
Pacific Screech-Owl	yes	no
Trogonidae		
Black-headed Trogon	yes	no
Gartered Trogon	no	yes
Momotidae		
Keel-billed Motmot	no	yes
Alcedinidae		
Ringed Kingfisher	yes	no
Green Kingfisher	yes	no
Bucconidae		
White-necked Puffbird	yes	no
Ramphastidae		
Keel-billed Toucan	no	yes
Yellow-throated Toucan	no	yes
Picidae		
Hoffmann's Woodpecker	yes	yes
Pale-billed Woodpecker	yes	yes
Falconidae		
Laughing Falcon	yes	no
Yellow-headed Caracara	yes	no

Crested Caracara	yes	no
Psittacidae		
Yellow-naped Parrot	yes	no
Orange-chinned Parakeet	yes	yes
White-fronted Parrot	yes	yes
Orange-fronted Parakeet	yes	no
Red-lored Parrot	no	yes
Pipridae		
Long-tailed Manakin	yes	no
Red-capped Manakin	no	yes
White-collared Manakin	no	yes
White-ruffed Manakin	no	yes
Tityridae		
Black-crowned Tityra	no	yes
Cinnamon Becard	no	yes
Masked Tityra	no	yes
Onychorhynchidae		
Royal Flycatcher	no	yes
Tyrannidae		
Bright-rumped Attila	yes	no
Dusky-capped Flycatcher	yes	no
Great Kiskadee	yes	yes
Yellow-olive Flycatcher	yes	no
Brown-crested Flycatcher	yes	no
Great Crested Flycatcher	yes	yes
Scissor-tailed Flycatcher	yes	no
Boat-billed Flycatcher	yes	yes
Social Flycatcher	yes	yes
Streaked Flycatcher	no	yes
Rufous Mourner	no	yes
Tropical Kingbird	no	yes
Gray-capped Flycatcher	no	yes
Tropical Pewee	no	yes
Long-tailed Tyrant	no	yes
Common Tody-Flycatcher	no	yes
Thamnophilidae		
Chestnut-backed Antbird	no	yes
Black-crowned Antshrike	no	yes
Furnariidae		
Streak-headed Woodcreeper	yes	yes
Vireonidae		
Yellow-throated Vireo	yes	yes
Philadelphia Vireo	yes	yes
Lesser Greenlet	no	yes
Corvidae		
White-throated Magpie-Jay	yes	no

Brown Jay	no	yes
Hirundinidae		
Blue-and-white Swallow	no	yes
Northern Rough-winged Swallow	no	yes
Southern Rough-winged Swallow	no	yes
Polioptilidae		
White-browed Gnatcatcher	yes	yes
White-lored Gnatcatcher	yes	yes
Long-billed Gnatwren	no	yes
Troglodytidae		
Rufous-naped Wren	yes	no
Banded Wren	yes	no
Bay Wren	no	yes
House Wren	no	yes
Nightingale Wren	no	yes
Turdidae		
Clay-colored Thrush	yes	yes
White-throated Thrush	no	yes
Fringillidae		
Scrub Euphonia	yes	no
Yellow-throated Euphonia	no	yes
Passerellidae		
Orange-billed Sparrow	no	yes
Icteridae		
Great-tailed Grackle	yes	yes
Baltimore Oriole	yes	yes
Melodious Blackbird	yes	yes
Streak-backed Oriole	yes	no
Montezuma Oropendola	no	yes
Parulidae		
Yellow Warbler	yes	yes
Black-and-white Warbler	yes	yes
Prothonotary Warbler	yes	no
American Redstart	yes	no
Tennessee Warbler	yes	yes
Chestnut-sided Warbler	no	yes
Buff-rumped Warbler	no	yes
Tropical Parula	no	yes
Cardinalidae		
Western Tanager	yes	no
Summer Tanager	yes	yes
Rose-breasted Grosbeak	no	yes
Carmiol's Tanager	no	yes
Red-throated Ant-Tanager	no	yes
Blue-black Grosbeak	no	yes

Thraupidae		
Green Honeycreeper	no	yes
White-shouldered Tanager	no	yes
Blue Dacnis	no	yes
Blue-gray Tanager	no	yes
Scarlet-rumped Tanager	no	yes
Silver-throated Tanager	no	yes
Golden-hooded Tanager	no	yes
Blue-black Grassquit	no	yes
Yellow-faced Grassquit	no	yes
Palm Tanager	no	yes
Buff-throated Saltator	no	yes
Bananaquit	no	yes
Variable Seedeater	no	yes
White-throated Shrike-Tanager	no	yes
Choloepodidae (Mammalia)		
Hoffmann's two-toed Sloth	no	yes

2. Observations by family

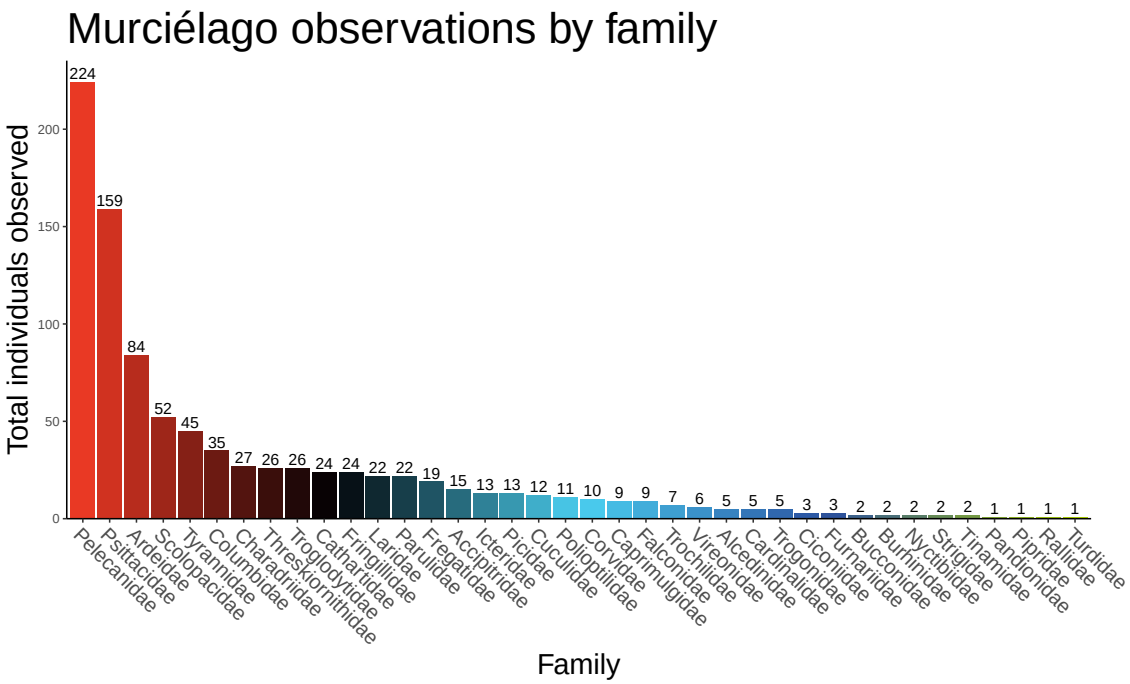
I was curious about the number of observations by family (I would not, for example, expect many observations of Trochilidae regardless of how many there may have been flitting around...). To do this, I calculated the total number of observed individuals for each family for each count, and made a bar graph displaying all families detected.

a. Code

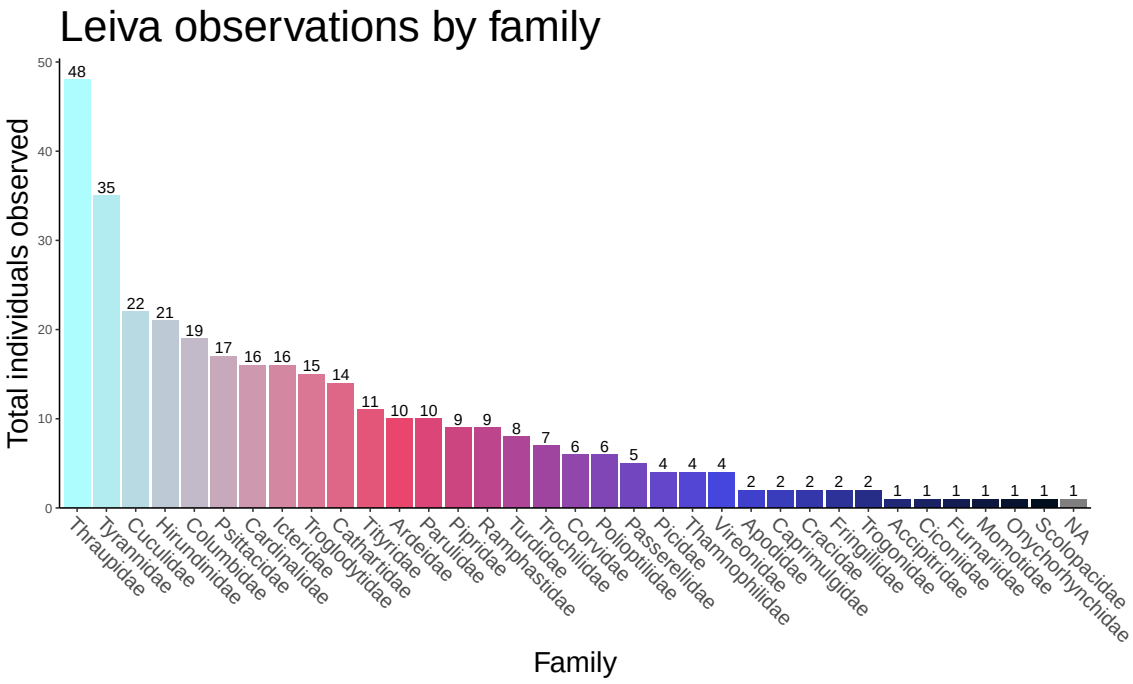
There are two code chunks here. The first calculates the total number of observed individuals of each family in each count. Since I'm doing this twice (once for `murci`, and once for `leiva`), I created a function called `family_summary` so that I wouldn't have to rewrite (or, realistically, copy/paste) the same code twice. The objects that come out of this are `murci_familiies` and `leiva_families`.

The second code chunk creates the bar plots: columns for each family with a label indicating how many individuals were observed. Similarly to what I did above, I created a function to put all the same code in one place. The objects here are called `murci_families_bar` and `leiva_families_bar`.

b. Plots



We saw *a lot* of Brown Pelicans on our Santa Rosa count. Also, lots of parrots! Seems they are not locally extinct after all.



It seems that we saw lots of tanagers (Thraupidae) at Leiva (not surprising!), followed by flycatchers (Tyrannidae), and cuckoos (Cuculidae, mostly Squirrel Cuckoos).

2. Rank abundance

a. What is a rank abundance curve?

Rank abundance curves are plotted with the proportion (or raw number of) observations for each species on the y-axis, and rank on the x-axis. From these plots, you can glean information about how abundant species were in your data.

b. Code

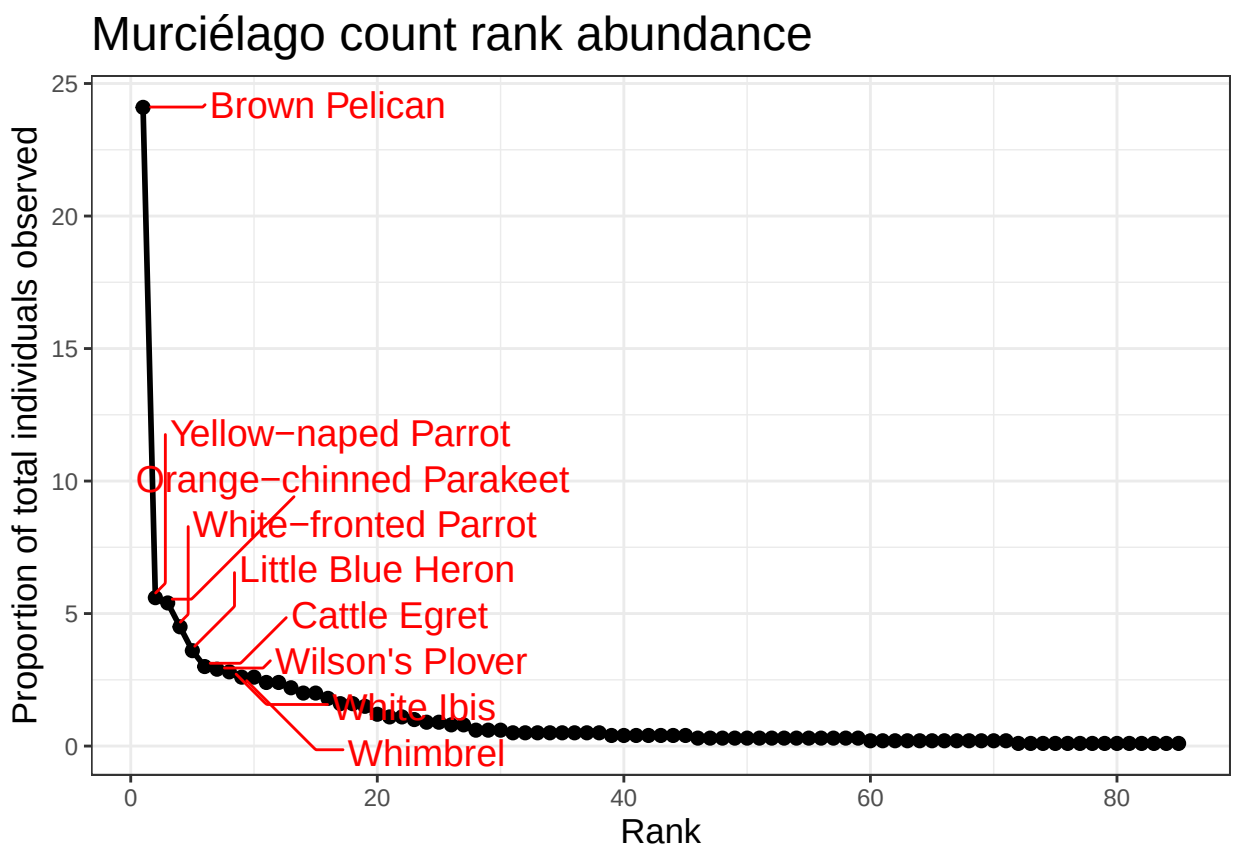
First, I'll make a data frame to calculate rank abundance where each column is a species (n = 150) and each row is a "site" (n = 2, either "leiva" or "murci"). The cells are filled with the total number of observations for each species.

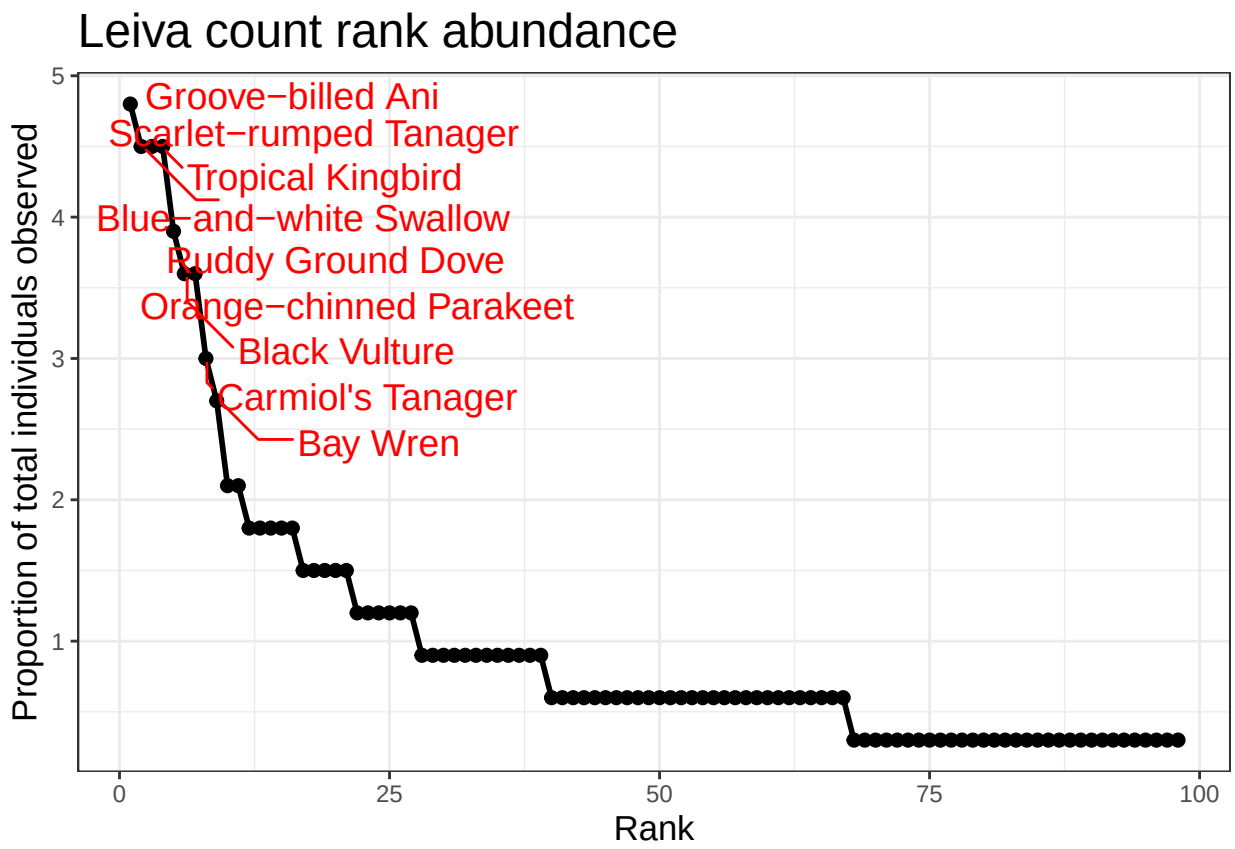
I'll also make a data frame with the site information: not especially informative, but useful for plotting the data later.

To make the plot, I'll use the `BiodiversityR::rankabundance()` function to calculate rank abundance for Leiva and Murciélago.

Plot code below, with a function to keep things tidy.

b. Plots


Murciélago count rank abundance
Proportion of total individuals observed
Rank
25
20
15
10
5
0
0
20
40
60
80
Brown Pelican
Yellow−naped Parrot
Orange−chinned Parakeet
White−fronted Parrot
Little Blue Heron
Cattle Egret
Wilson's Plover
White Ibis
Whimbrel



A little test...