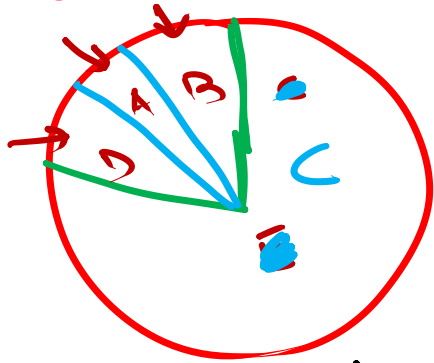


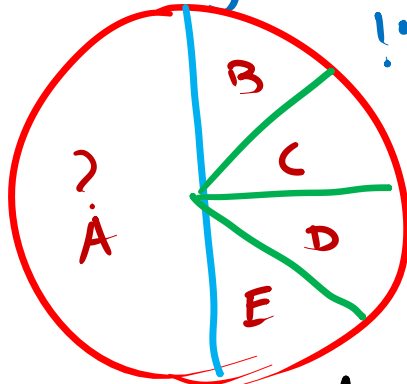
# Global biodiversity

Robert May = 7 million

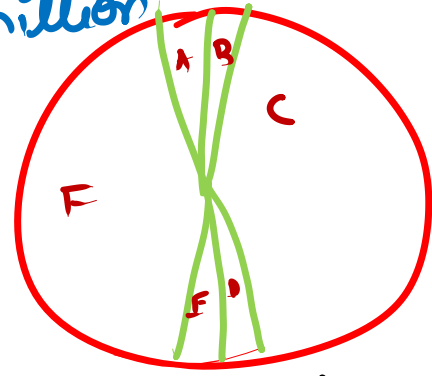
! 5 million



Invertebrates



Vertebrates



Plants

A ⇒ Crustaceans

B ⇒ other animal groups

C ⇒ Insect

D ⇒ Mollusks

A ⇒ Fishs

B ⇒ Mammals

C ⇒ Birds

D ⇒ Reptiles

E ⇒ Amphibians

A ⇒ Mosses

B ⇒ Ferns and allies

C ⇒ Angiosperms

D ⇒ Lichens

E ⇒ Algae

F ⇒ Fungi

1) Fish > Birds > Reptiles > Amphibians > Mammals

2) Angiosperm > Fungi > Algae > Mosses > Ferns > Lichens

# Species richness & area relationship

German naturalist and geographer  $\Rightarrow$  Alexander von Humboldt

Straight line  $\Rightarrow$   $S = \text{Species richness}$

$$\log S = \log C + z \log A$$

Species richness  $\uparrow \uparrow \propto$  Explored area  $\uparrow \uparrow$   
 $\rightarrow$  But only up to limit.

$A = \text{Area}$   
 $S = \text{Species richness}$   
 $z = \text{slope of the line (regression coefficient)}$   
 $C = \text{Y-intercept}$

Species richness



$S = CA^z$   
 $\log S = \log C + z \log A$   
 $\Rightarrow$  wide variety of taxa

- $\rightarrow$  Angiosperm plants
- $\rightarrow$  Birds, bats
- $\rightarrow$  Fresh water fishes

$\Rightarrow$  Rectangular hyperbola

$\leftarrow$   $(A)$  Area  $\rightarrow$  Columbia, India, New York, Greenland, Norway  
 plants, Britian, birds in California - Mollusca in New York

# Patterns of Biodiversity

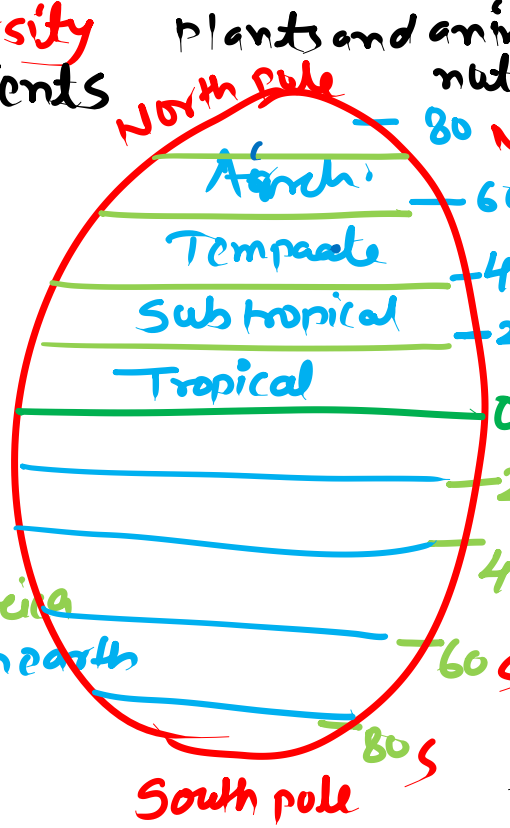
## A) Latitudinal gradients

**Latitude**  
 distance from eq ↑  
 ⇒ Temp ↓ div ↓  
 rainfall ↓

**Altitude**  
 height from sea level  
 Temp ↓ div ↓  
 rainfall ↓

Tropical Amazonian rain forest ⇒ South America  
 the greatest biodiversity on earth

- 40,000 ⇒ Plants
- 3,000 ⇒ fishes
- 13,000 ⇒ Birds
- 4,27 ⇒ mammals
- 4,27 ⇒ Amphibian
- 1,25,000 ⇒ invertebrates



Plants and animal diversity not uniform throughout the world

ABLES<sup>®</sup> KOTA

1) as we move away from the equator towards the poles.

Tropics > Temperate  
 ↳ latitudinal range  
 (23.5° N to 23.5° S)

2) Colombia ⇒ equator ⇒ 1400 species of birds

3) New York at 41° N ⇒ 105

Greenland at 71° N ⇒ 56

Tropical latitude ⇒ more than 1200 species of birds  
 Midwest of USA