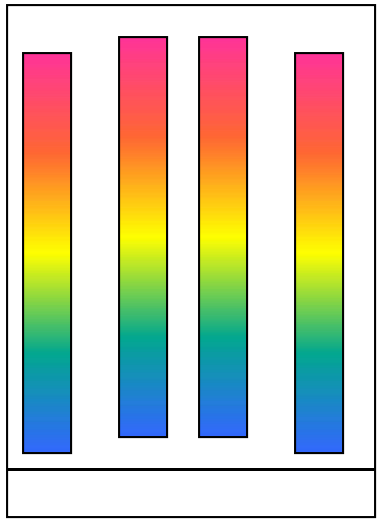
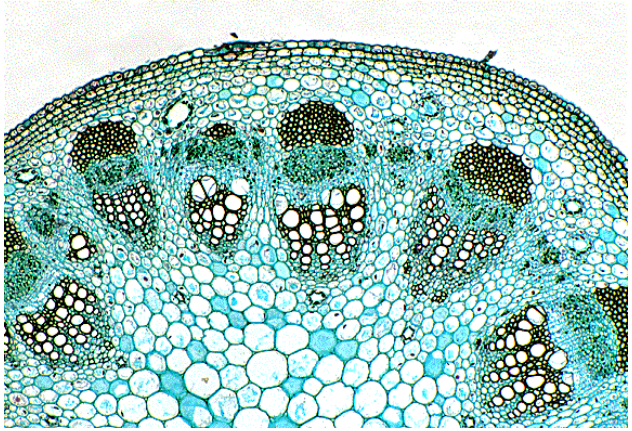
Relationships and Biodiversity NYSED Lab





Please note:

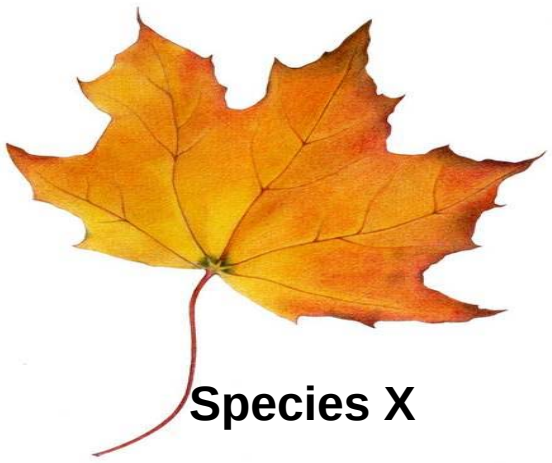
- “Curol” is a fictitious plant extract mentioned in the NYSED lab that has the ability to effectively treat cancer. IT DOES NOT EXIST. Likewise, any “Curol” images included in this presentation are simply images taken from an internet search and are not a cancer cure. It is simply a product found with a similar name. I do not know what it is used for as the website was not translated into the English language.

What does this lab entail?

- Seven tests that look at the physical, chemical, and microscopic characteristics of three plants that may be able to create Curol, even though they are not *Botana curus* (the plants that does produce it).
- Comparison of data to determine relationships.
- Define the crucial need for biodiversity.

Test 1 - Structural Characteristics of Plants

Botana curus



Species X

QUESTION:

Which leaves most closely resemble the leaves produced by *Botana curus*?

Record your observations in the data table.

Species Z

Species Y

Test 2 – Structural Characteristics of Seeds

Botana curus seeds

Species Z seeds

QUESTION:

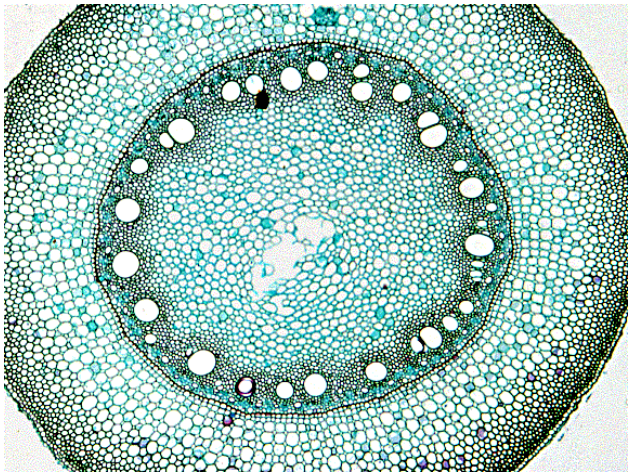
Which seeds most closely resemble the seeds produced by *Botana curus*?

Record your observations in the data table.

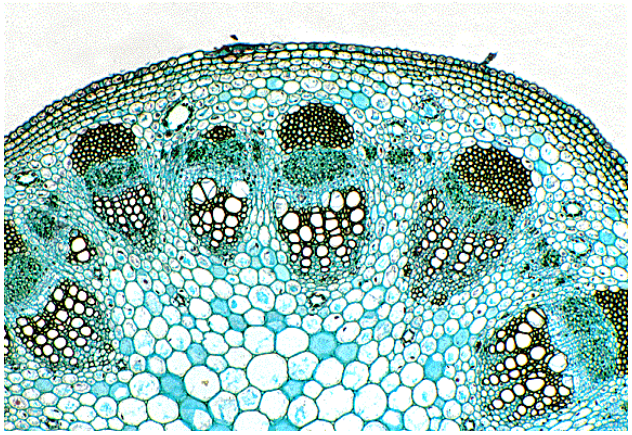
Species X seeds

Species Y seeds

Test 3 – Microscopic Internal Structures of Stems



Botana curus

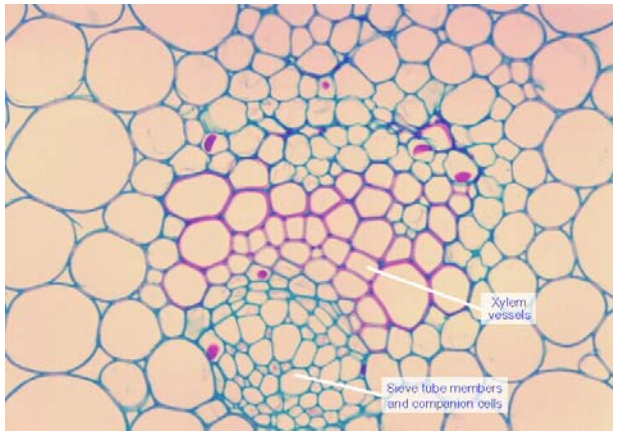


Species Y

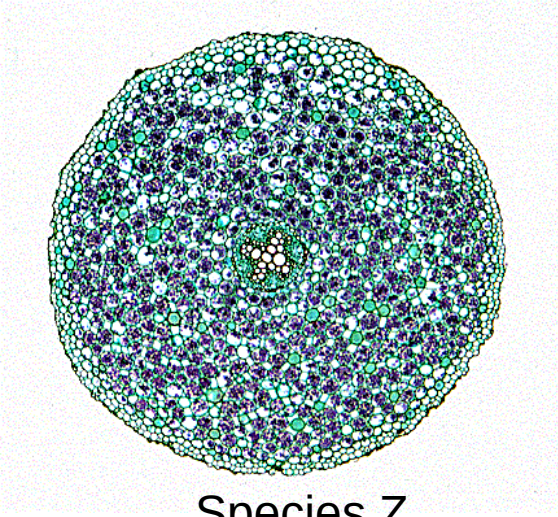
QUESTION:

Which stem structures most closely resemble the stem structures of *Botana curus*?

Record your observations in the data table.

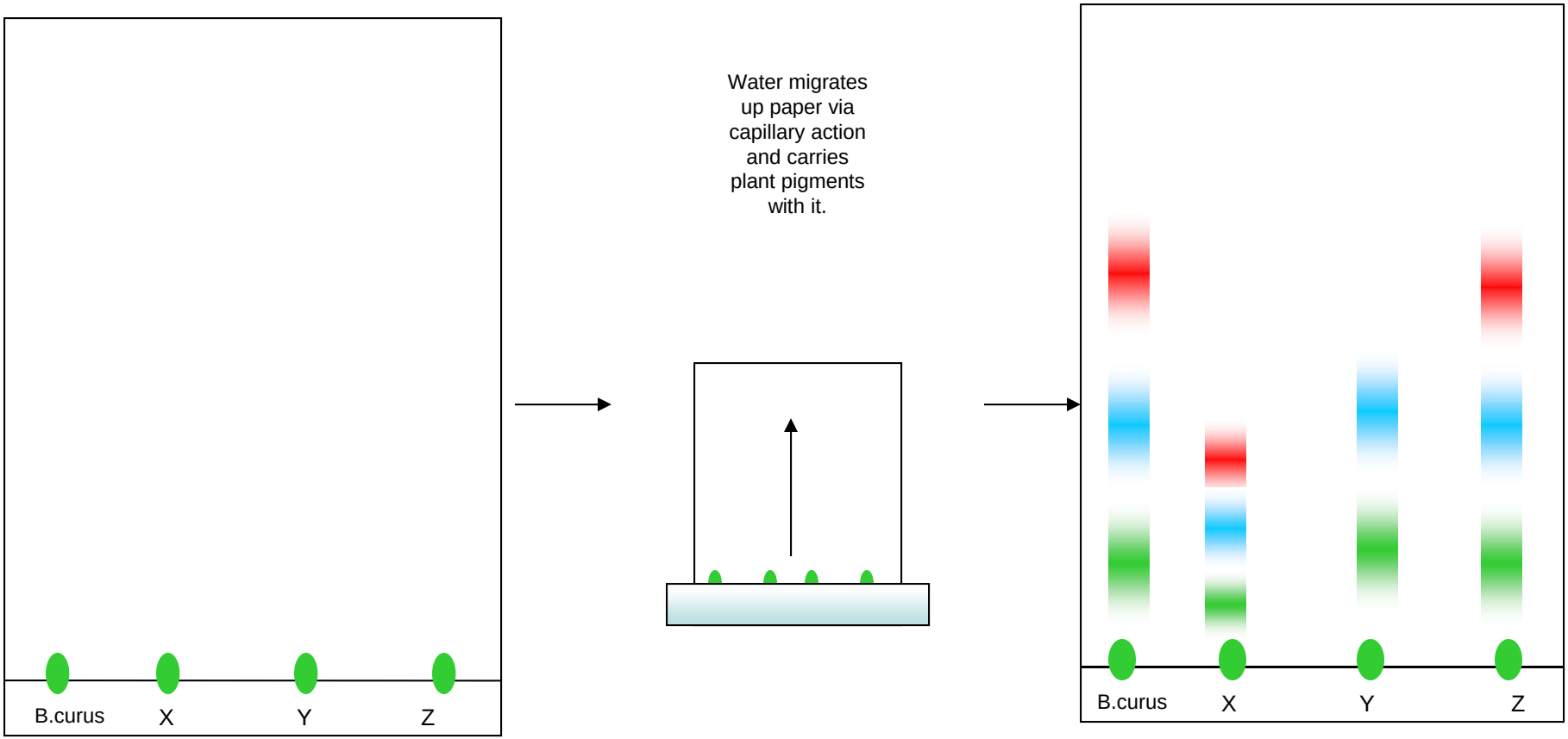


Species X



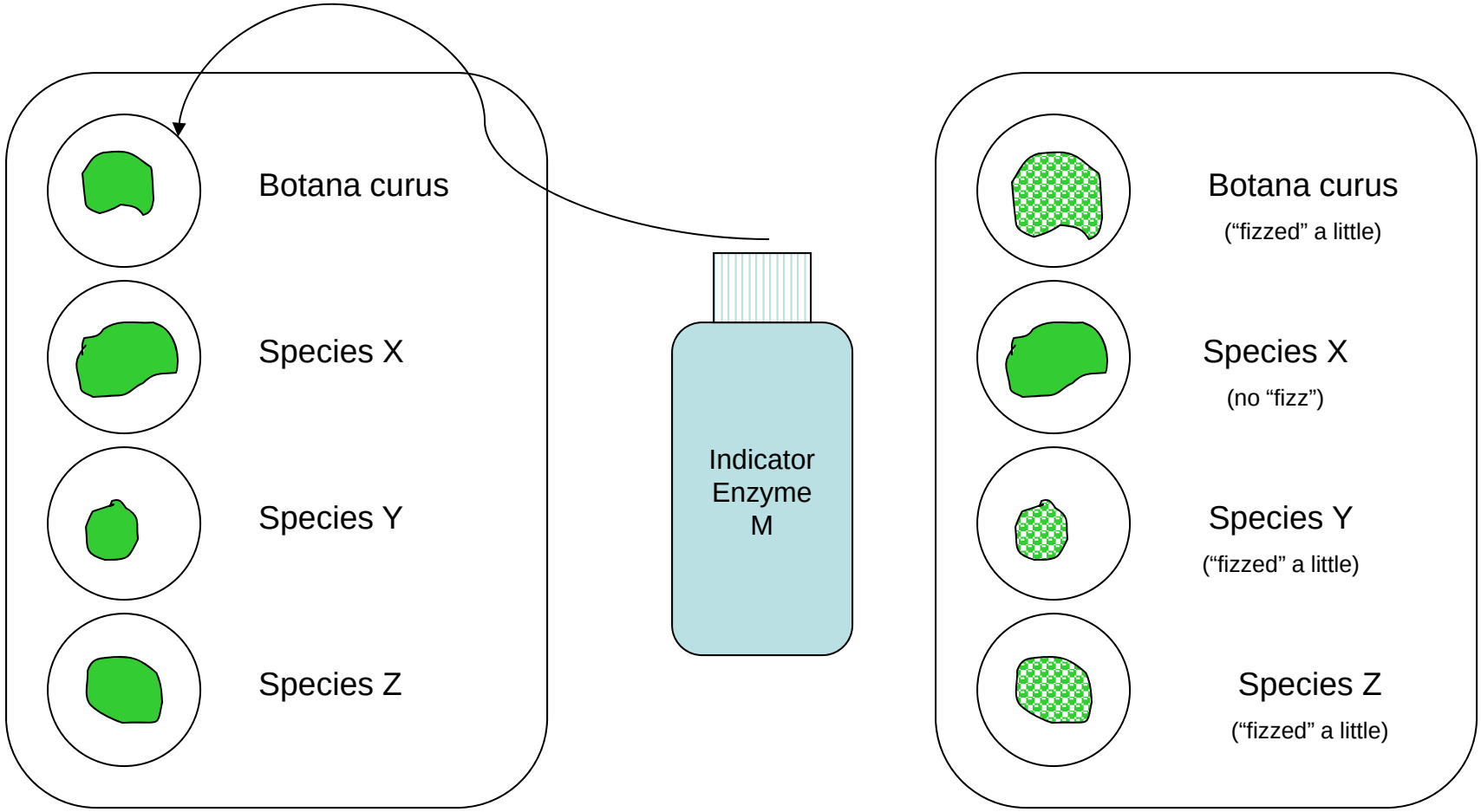
Species Z

Test 4 – Paper Chromatography to Separate Plant Pigments



"Spot" your chromatography paper and label it with a pencil.

Test 5 – Indicator Tests for Enzyme M



Put two drops of each plant Extract in separate wells of the well tray.

Add a small sprinkle of “Indicator Enzyme M”

Record your results.

Test 6 – Using Simulated Gel Electrophoresis to Compare DNA

The strips below represent the DNA strands extracted from each plant (*B. curus*, X, Y, and Z). Each strand will be "cut" between a double C/double G. Therefore, lines are drawn below where each strip should be cut. Then, count up the number of bases and paste appropriately in the simulated Gel Electrophoresis table on the next slide.

Botana curus A T T C C/G G A T C G A T C G C C/G G A T A T A C T C C/G G T A A T A T C

Species X A T T G T A C C/G G G A T C C/G G A C G T C G C G A C T A A T A T A G C A

Species Y A C C/G G T C C/G G G A T C G C A C C C/G G T A C T C C T G T A A T A T C

Species Z A T T C C/G G A T C G A T C G C C/G G A T A T T C T C C/G G T A A T A T

Simulated Gel Electrophoresis

# of Bases	*Botana curus*	Species X	Species Y	Species Z
24				
23				
22		GGACGTCGCGACTAATATAGCA		
21				
20				
19				
18				
17			GGTACTCCTGTAATATC	
16				
15				
14				
13				
12	GGATCGATCGCC		GGGATCGCACCC	GGATCGATCGCC
11	GGATATACTCC			GGATATACTCC
10				
9	GGTAATATC			GGTAATATC
8		ATTGTACC		
7		GGGATCC		
6				
5	ATTCC		GGTCC	ATTCC
4				
3			ACC	
2				
1				

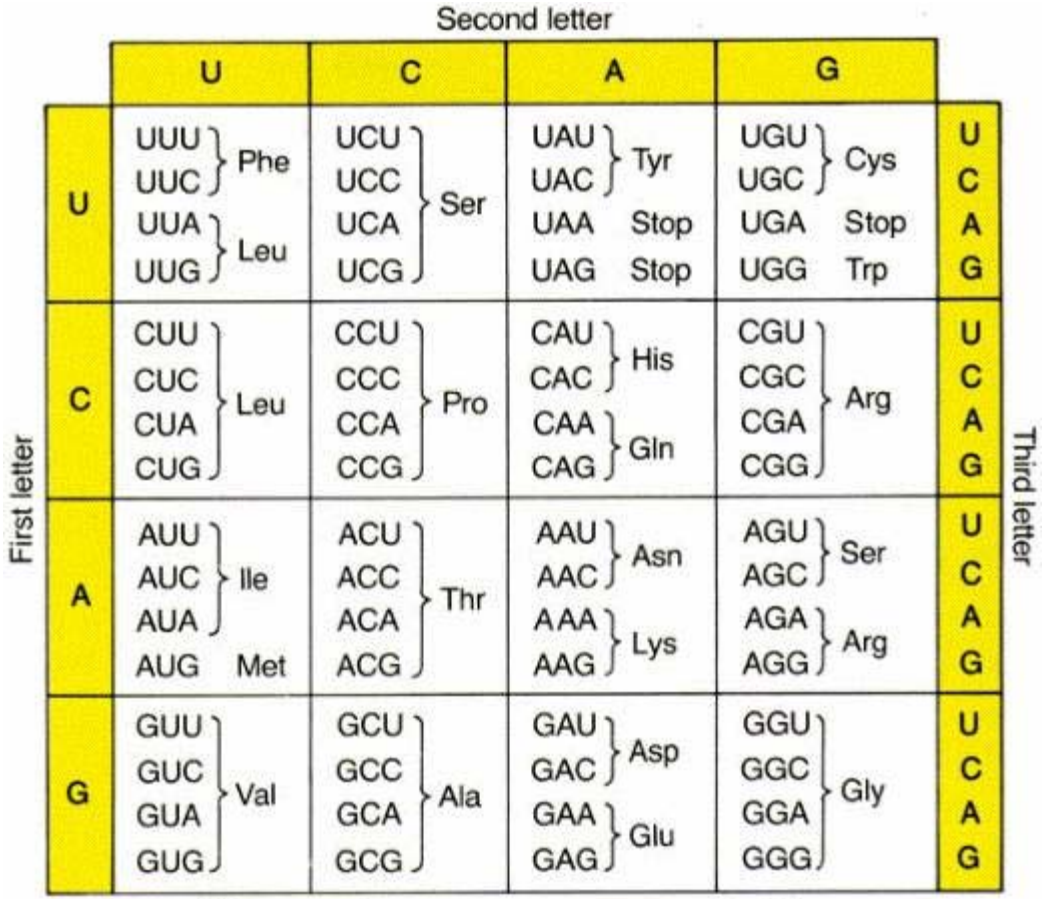
-

+

Test 7 – Molecular Evidence for Relationships

Botana curus	CAC	GTG	GAC	TGA	GGA	CTC	CTC
mRNA	*GUG*	*CAC*	*CUG*	*ACU*	*CCU*	*GAG*	*GAG*
Amino acid	*Val*	*His*	*Leu*	*Thr*	*Pro*	*Glu*	*Glu*
Species X	CAC	GTG	GAC	AGA	GGA	CAC	CTC
mRNA	*GUG*	*CAC*	*CUG*	*UCU*	*CCU*	*GUG*	*GAG*
Amino acid	*Val*	*His*	*Leu*	*Ser*	*Pro*	*Val*	*Glu*
Species Y	CAC	GTG	GAC	AGA	GGA	CAC	CTC
mRNA	*GUG*	*CAC*	*CUG*	*UCU*	*CCU*	*GUG*	*GAG*
Amino acid	*Val*	*His*	*Leu*	*Ser*	*Pro*	*Val*	*Glu*
Species Z	CAC	GTA	GAC	TGA	GGA	CTT	CTC
mRNA	*GUG*	*CAU*	*CUG*	*ACU*	*CCU*	*GAA*	*GAG*
Amino acid	*Val*	*His*	*Leu*	*Thr*	*Pro*	*Glu*	*Glu*

And where did you get those Amino Acids from???



Your friend and mine… The Universal Genetic Code Chart

So, what is the closest and most probable alternative source for Curol???

Test	***Most similar to Botana curus?***
Test 1 – Structural Characteristics of Plants	Species Z as it has the same kind of parallel veination in the leaves.
Test 2 - Structural Characteristics of Seeds	Species Z seeds are flat and striped, much the same as *Botana curus* seeds are.
Test 3 – Microscopic Internal Structure of Stems	Species Z vascular bundles closely resemble those of *Botana curus.*
Test 4 – Paper Chromatography of Pigments	Species Z and *Botana curus* share a similar pattern of pigmentation in paper chromatography.
Test 5 – Indicator Tests for Enzyme M	While many “fizzed”, once again Species Z and *Botana curus* reacted the same.
Test 6 – Simulated Gel Electrophoresis	Identical banding pattern in both *Botana curus* and Species Z.
Test 7 – Amino Acid Comparison	Species Z and *Botana curus* have the most similarities.

And the winner is…..

(insert drum roll here…)

Species Z