

# Diversity in seed morphology and anatomy in selected genera of the Lythraceae



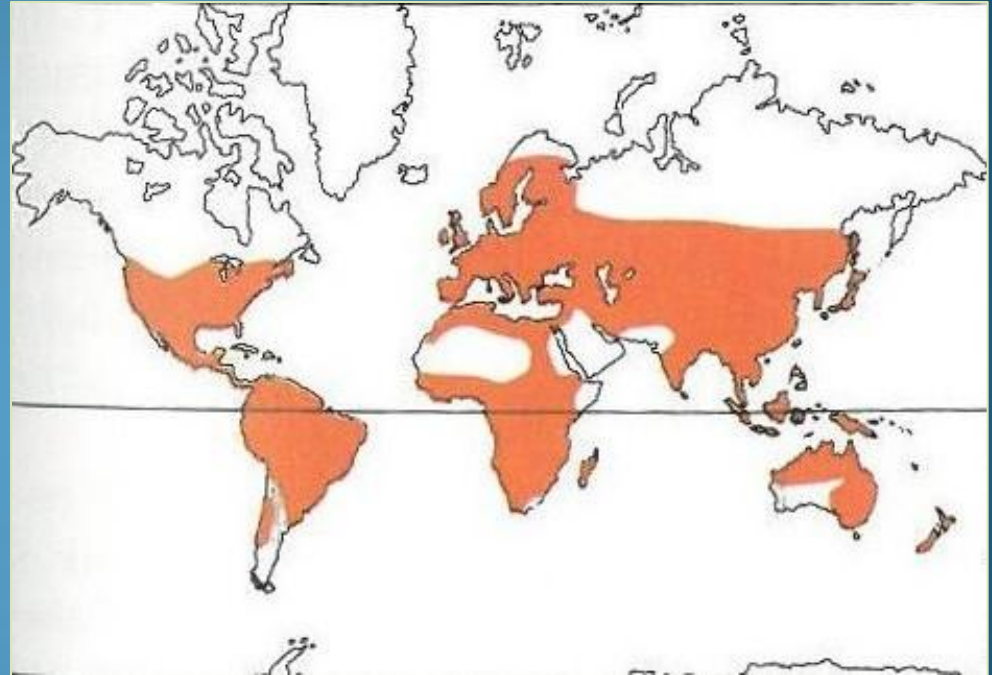
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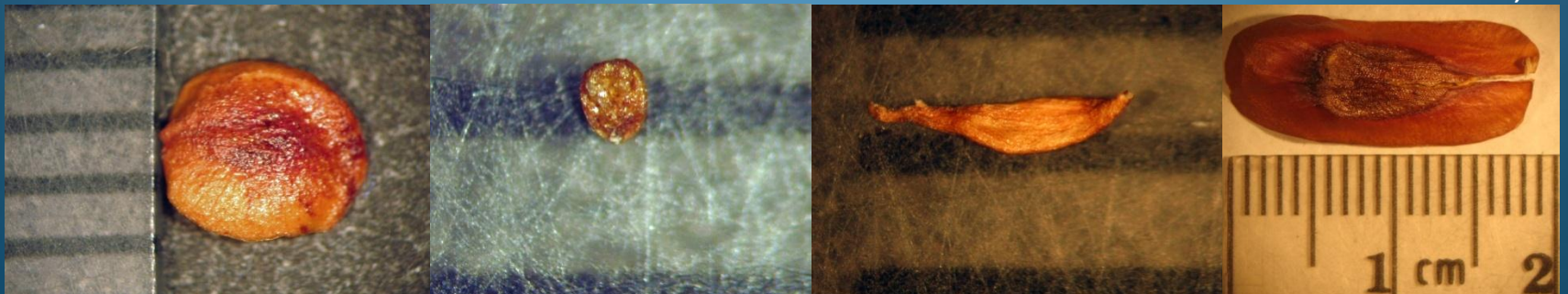
REU Missouri Botanical Garden 2012

# Introduction

- Lythraceae is a globally distributed family
- Occupies a range of habitats including woodland, mangrove, and aquatic
- Lythraceae seeds have a diverse morphology and a large range in size



Mackeith, 1978



*Galpinia*

*Ammannia*

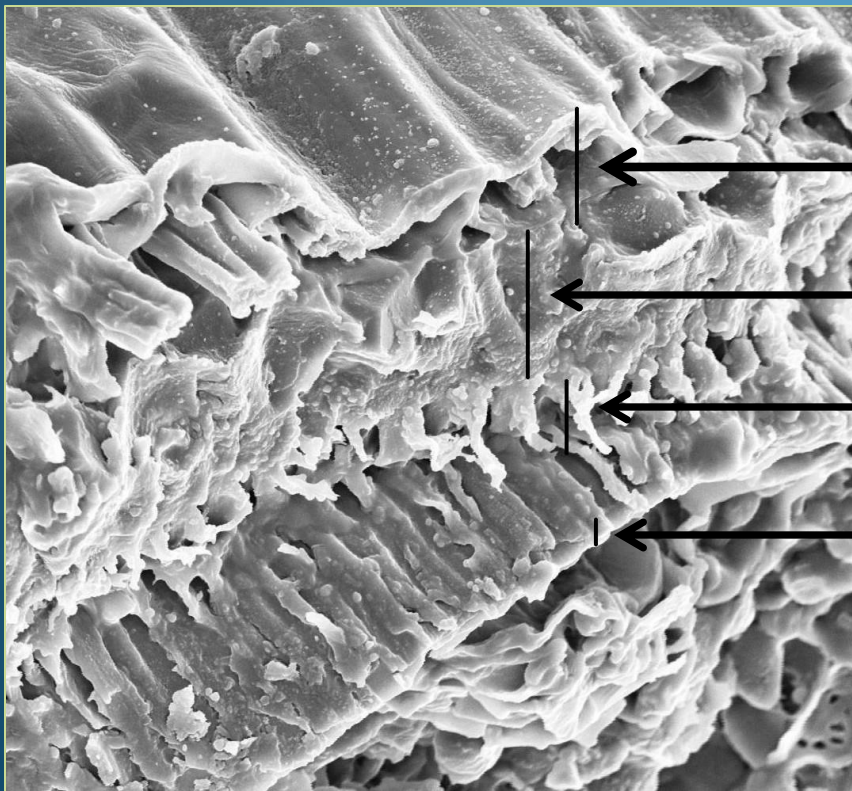
*Ginoria*

*Lafoensia*

# Introduction

The seed coat is comprised of an outer integument called the testa and an inner integument called the tegmen.

The Lythraceae are known to have a seed coat with a well-developed, multi-layered testa.



Exo-testa (epidermis)

Meso-testa

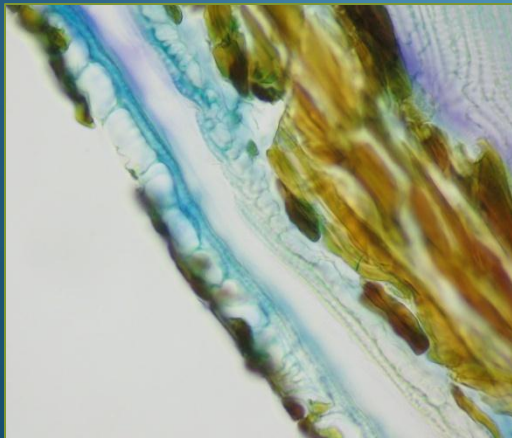
Endo-testa

Tegmen

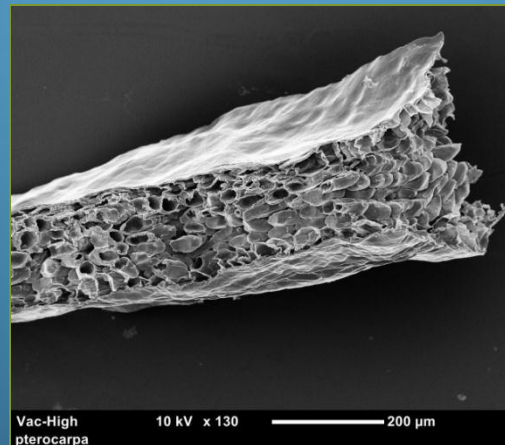
*Lythrum*

# Objective

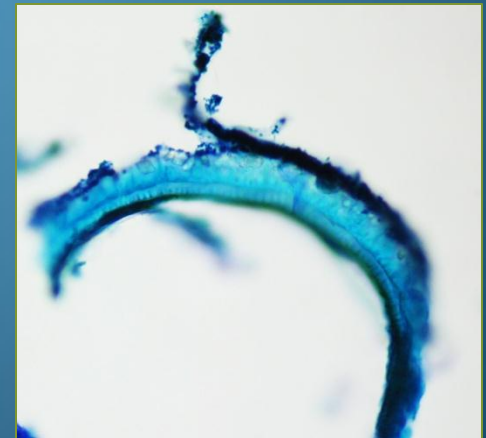
- This study used light microscopy and scanning electron microscopy to observe and describe seed characters in selected genera of the Lythraceae.



*Ginoria*



*Galpinia*



*Lythrum*

# Methods

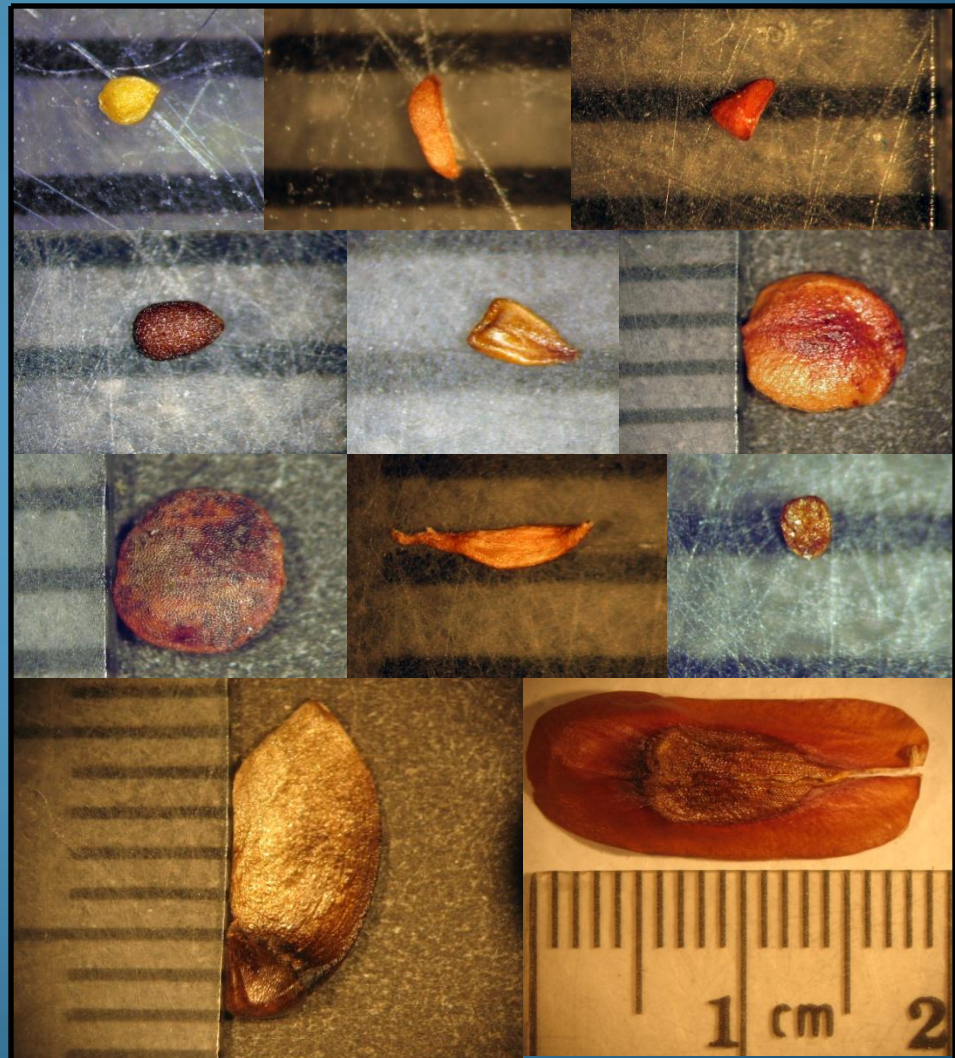
- Seeds were soaked in 4% ethylenediamine overnight to soften the tissue
- The paraffin blocks were sliced with a rotary microtome at 10 $\mu$ m
- Specimens were mounted and stained with toluidine blue
- Seeds observed with SEM were broken or cut with a razor blade



# Results & Discussion

# Genera

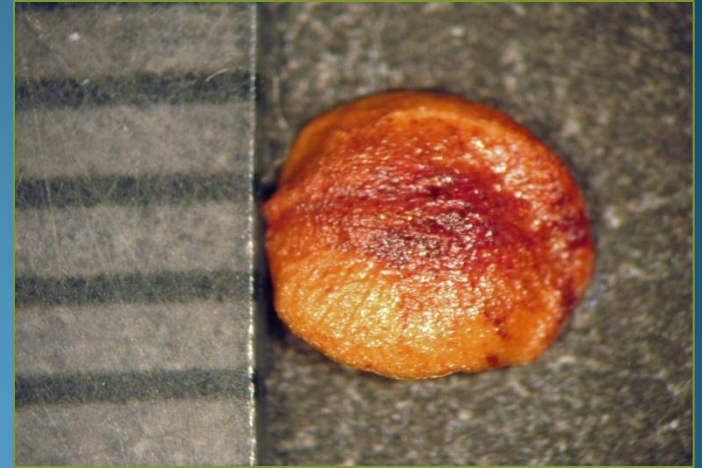
- *Lythrum*
- *Didiplis*
- *Heimia*
- *Pleurophora*
- *Pehria*
- *Galpinia*
- *Cuphea*
- *Ginoria*
- *Ammannia*
- *Lagerstroemia*
- *Lafoensia*\*



\* SEM only

# Wings

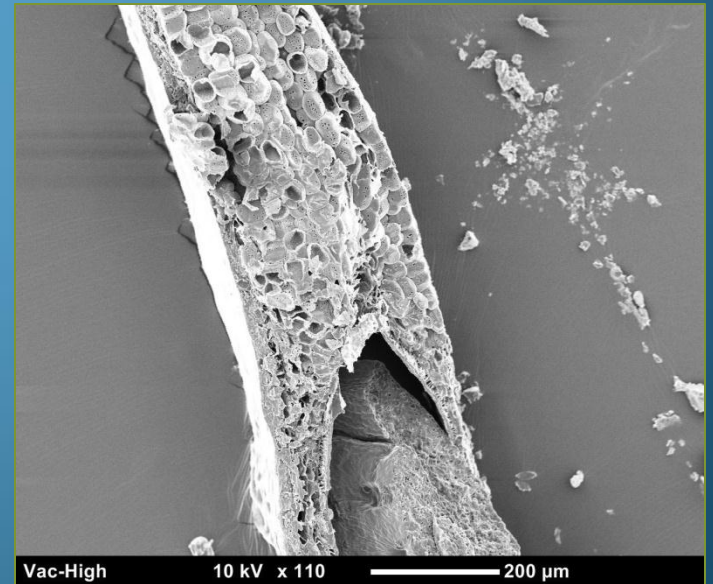
- Diversity in wing morphology within the family
- Light, thin-walled cells imply wind dispersal



*Galpinia*



*Lagerstroemia*

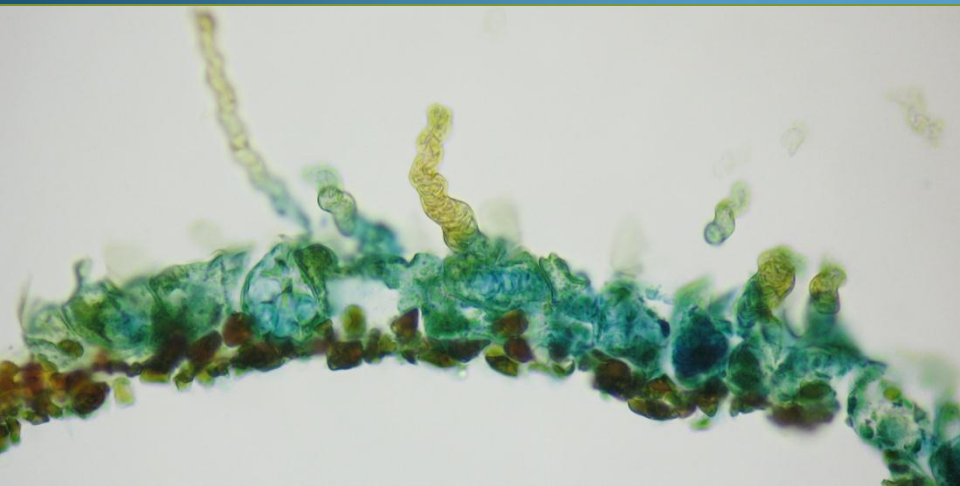


*Lafoensia*

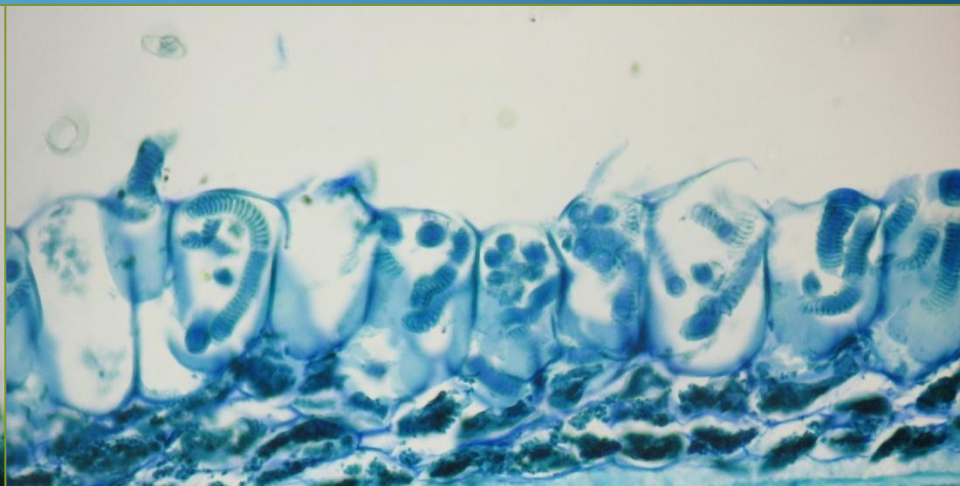


# Spiral epidermal trichomes

- Found in epidermal layer
- Spiral shaped in *Cuphea*, *Pleurophora*, *Lafoensia*
- Seeds are more easily fixed to the soil



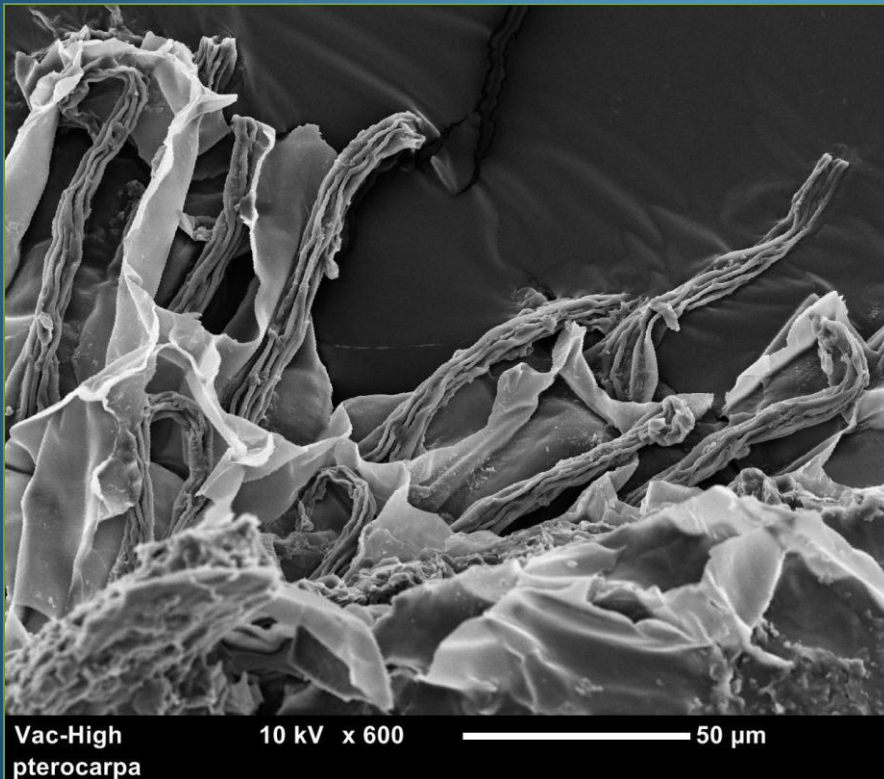
*Pleurophora*



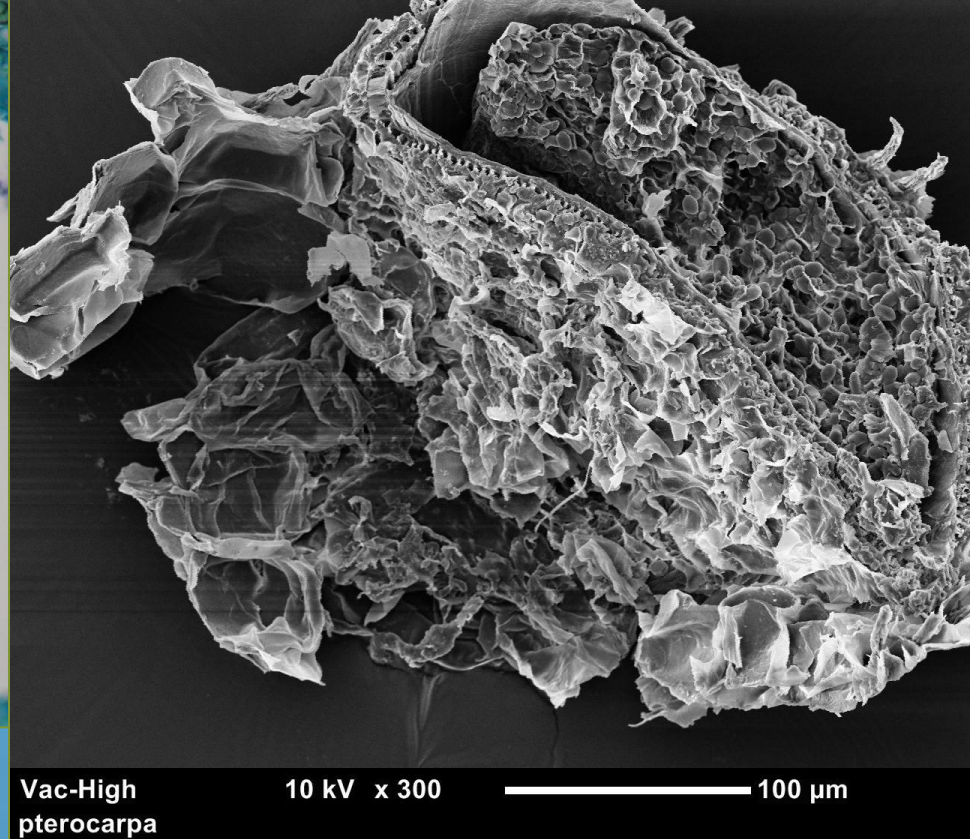
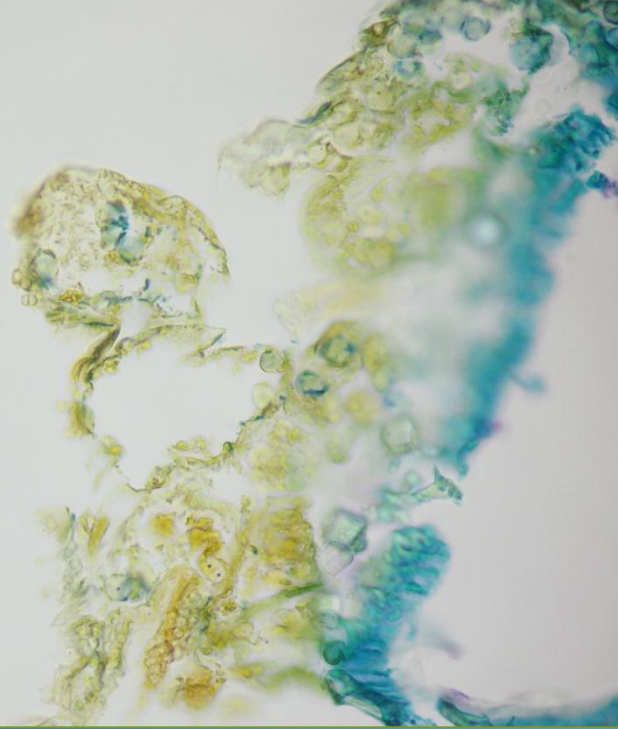
*Cuphea*

# Straight epidermal trichomes

- Found in epidermal layer
- *Ammannia*, *Ginoria*,  
*Pehria*, *Heimia*, *Didiplis*,  
*Lythrum*



*Ammannia*



- Epidermal layer
- Assist in dispersal in aquatic environments

Float Cells - *Ammannia*

# Summary of Seed Characters

Table 1. Seed characters of selected genera of Lythraceae

Taxon	Size L,W (mm)	Outline	Wings	Spiral epidermal trichomes	Straight epidermal trichomes	Aerenchyma float cells	Crystals present
<i>Lythrum californicum</i>	0.4, 0.3	obovate	-	-	+	-	+
<i>Didiplis diandra</i>	0.7, 0.3	oblong	-	-	+	-	+
<i>Heimia apetala</i>	0.6, 0.4	obtriangular	-	-	+	-	+
<i>Pleurophora saccocarpa</i>	0.8, 0.5	obovate	-	+	-	-	+
<i>Pehria compacta</i>	0.6, 0.3	obong	-	-	+	-	+
<i>Galpinia transvalica</i>	3.0, 3.0	sub-orbicular	+	-	-	-	-
<i>Cuphea confertiflora</i>	2.0, 2.0	orbicular	-	+	-	-	+
<i>Ginoria midiflora</i>	1.8, 0.4	oblong	-	-	+	-	-
<i>Ammannia coccines</i>	0.3, 0.3	obovate	-	-	+	+	+
<i>Lagerstroemia indica</i> cultivated	7.0, 4.0	obtriangular	+	-	-	-	-
<i>Lafoensia vandelliana</i>	19.0, 10.0	oblong	+	+	-	-	+

# Conclusion

- The diversity in seed characters supports a variety of dispersal mechanisms suited for a range of habitats.
- The variety of characters that enhance dispersal have allowed Lythraceae to occupy habitats across the globe.

# Acknowledgements

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