



# *Peperomia:*

A Fascinating Genus

Sally Williams

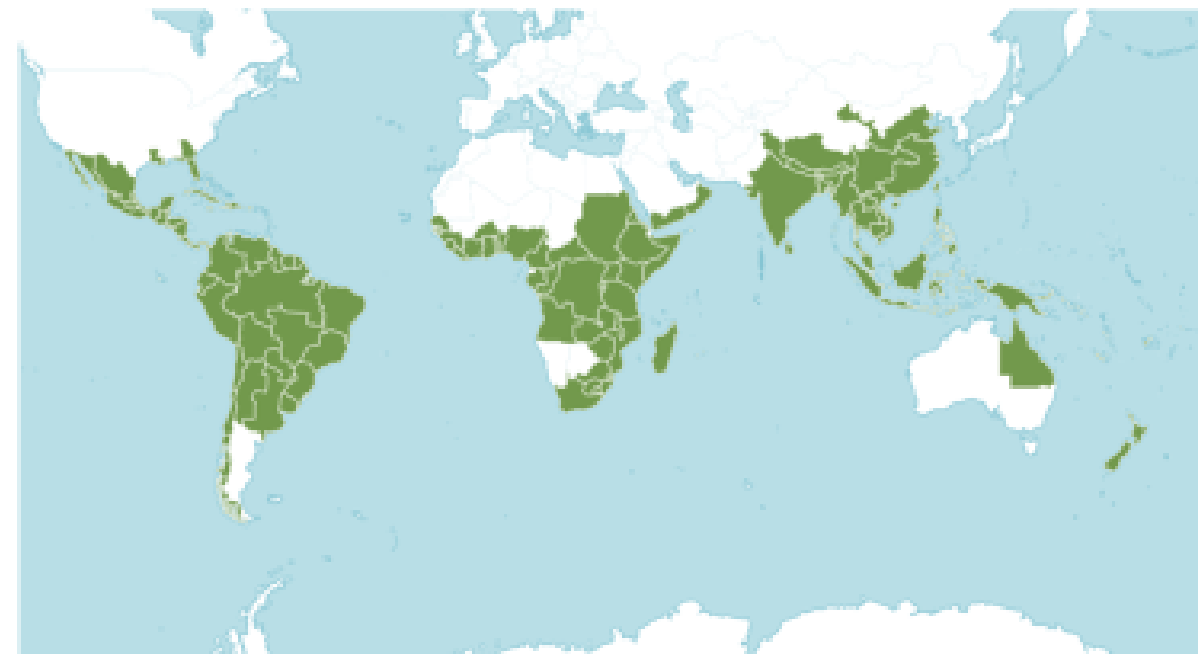
National Plant Collection Holder for the genus

*Peperomia* cvs.





# The genus *Peperomia*



[plantsoftheworldonline.org](http://plantsoftheworldonline.org)

- Primitive plants in Magnoliid clade
- Approximately 1500\* species
- Chaotic taxonomy divided into 14 subgenera
- Distribution: Tropical and Sub-tropical zones
- Habitats: eg. rain forest, cloud forest, high altitude desert
- epiphytic, lithophytic, terrestrial, true geophytes





# Habitat



*P. Colobiformis* – Guido Matheiu 1



*P. Marginata* - wikicommons





# The genus *Peperomia*

- Perennial or occasionally annual, often succulent herbs
- Stems erect, upright or trailing
- Flower spike: usually simple (mousetail), can be compound or globose (rabbit-tail)
- Flower Structure: Perianthless
  - Peltate bract
  - Two stamens
  - Single ovule in ovary
  - Each flower produces a single seed/fruit
- Huge variation in leaf size, shape, thickness, colouration, texture and degree of succulence



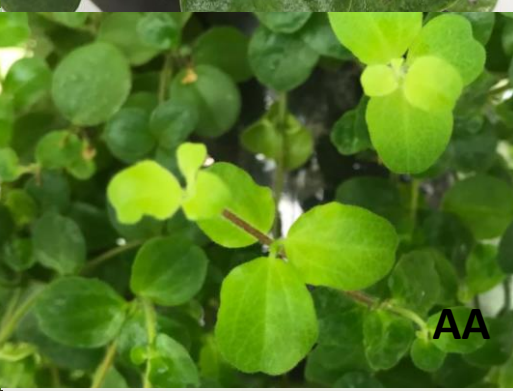
*Peperomia hutchisonii*













# *Peperomia* - common traits?

Despite the differences in morphology, *Peperomia* species have retained some early evolving traits which had evolved to cope with water stress, these include:

- Succulence <sup>(1)</sup>
- Potential to utilise the Crassulacean Acid Metabolism mode of photosynthesis, possibly displaying seasonal or facultative CAM <sup>(2)</sup>
- Variation in stomatal density

(1) Kaul 1977, (2) Holthe 1992



# Succulence

- Ability of a plant to store water independently of external water supply to enable it to maintain some physiological activity under water stress conditions
- All *Peperomia* have an upper epidermis specialised for water storage, the hydrenchyma <sup>(1)</sup>



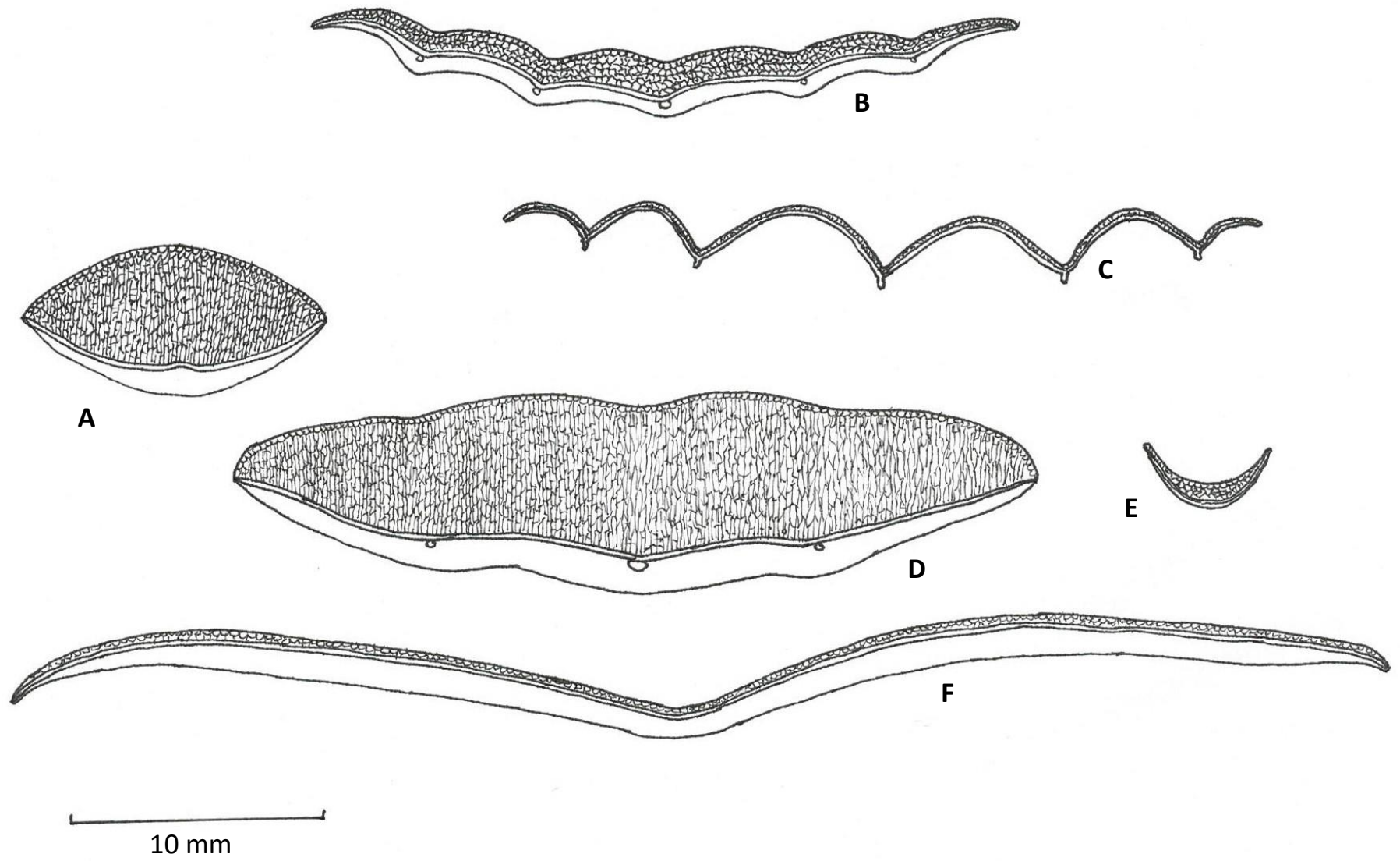
*P. obtusifolia* growing under normal(L) and very humid(R) conditions



- Characteristics expected to be seen in succulents:
  - the degree of succulence correlates negatively with mean annual precipitation <sup>(3)</sup>
  - associated with hot, dry habitats, but also epiphytic and high altitude habitats <sup>(5)</sup>
  - frequently associated with CAM photosynthesis



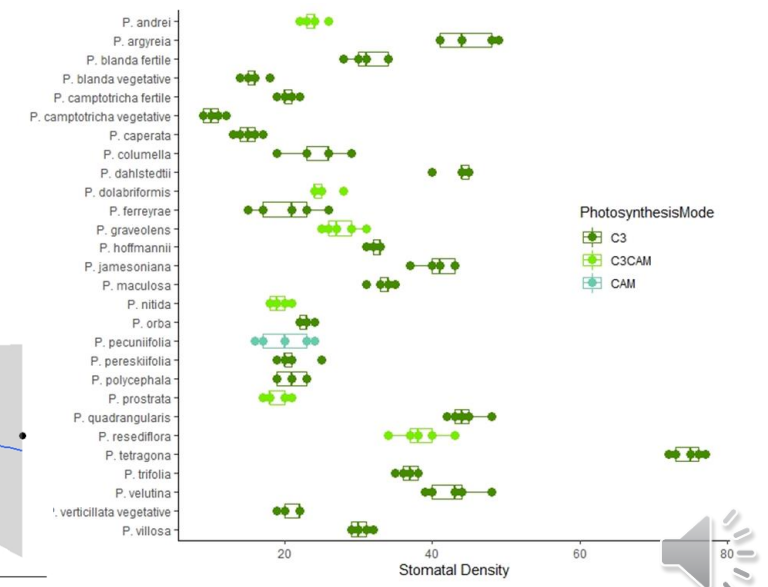
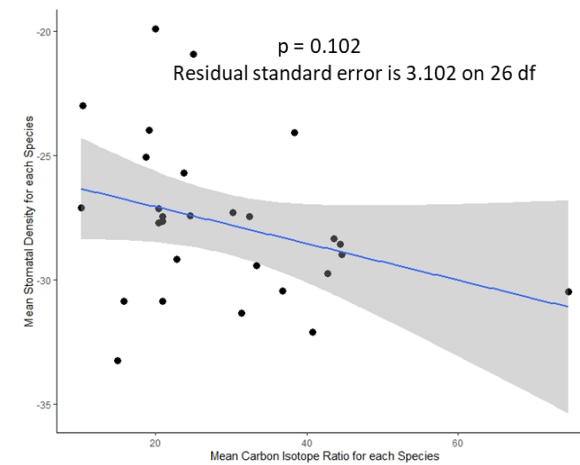
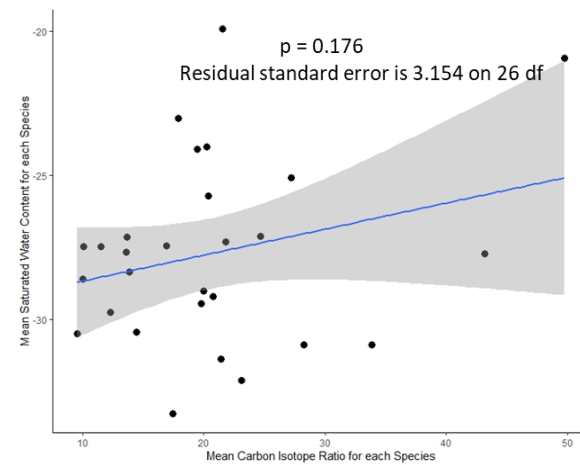
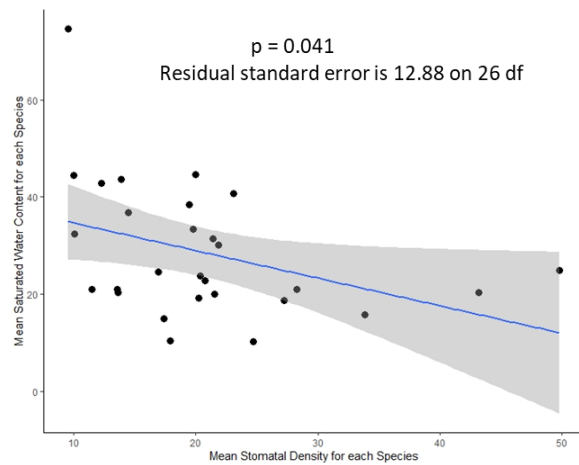
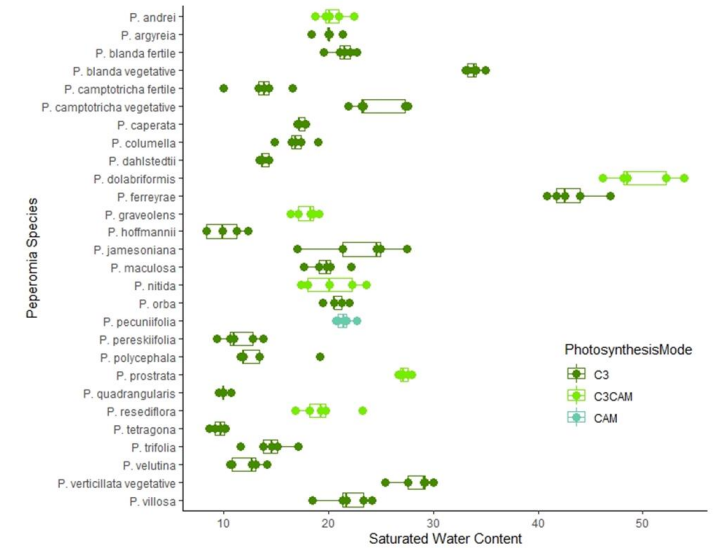






# Research Findings

- Degree of succulence was associated with stomatal density
- Neither succulence or stomatal density was related to the mode of photosynthesis used

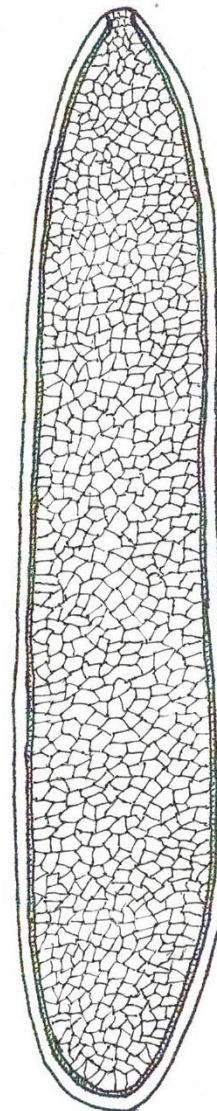
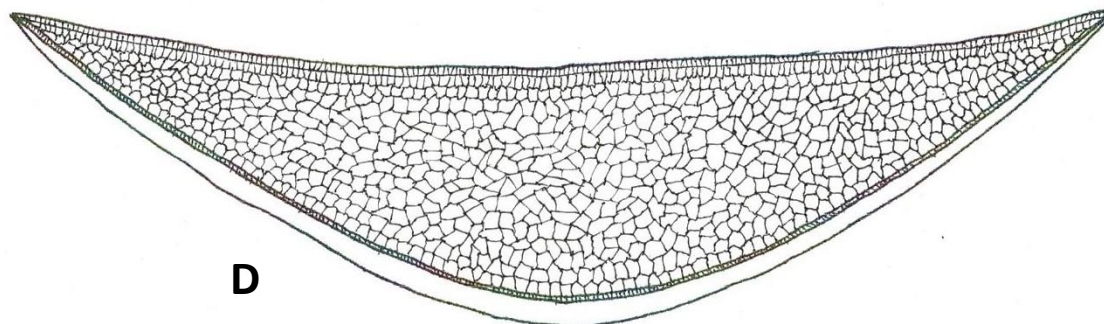
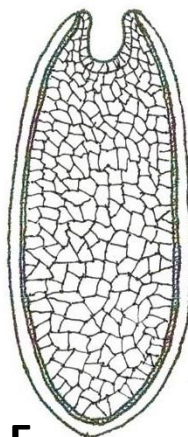
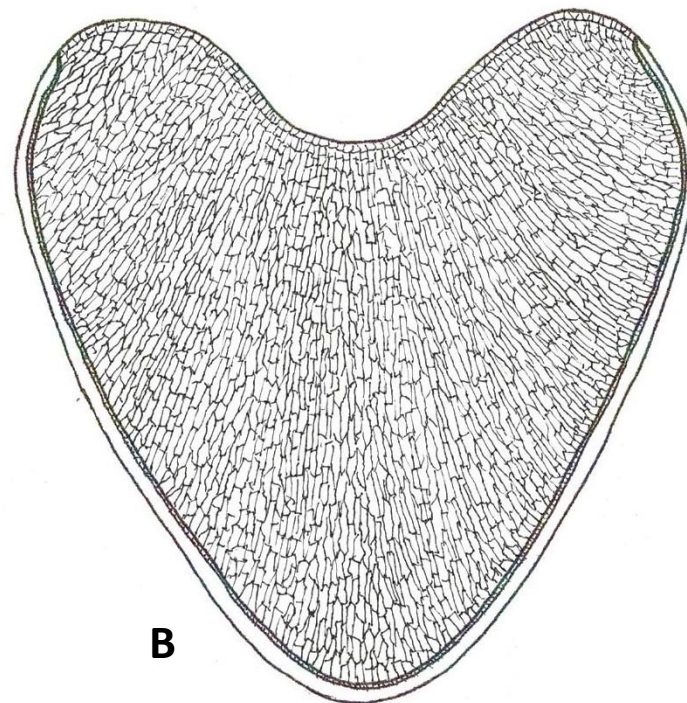
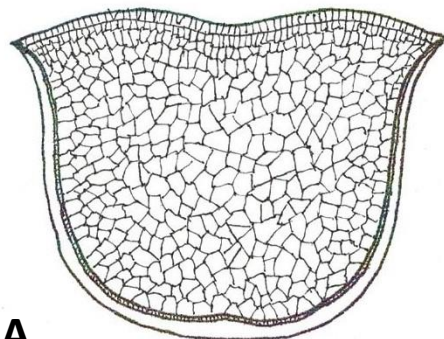




*Fenestratae Peperomia*







10 mm





# *Peperomia graveolens*



Normal folded-up leaves with abaxial anthocyanin pigmentation under normal growth conditions (12)



Small, flattened out leaves when grown under low light conditions (8)



Loss of pigmentation from growth under low light





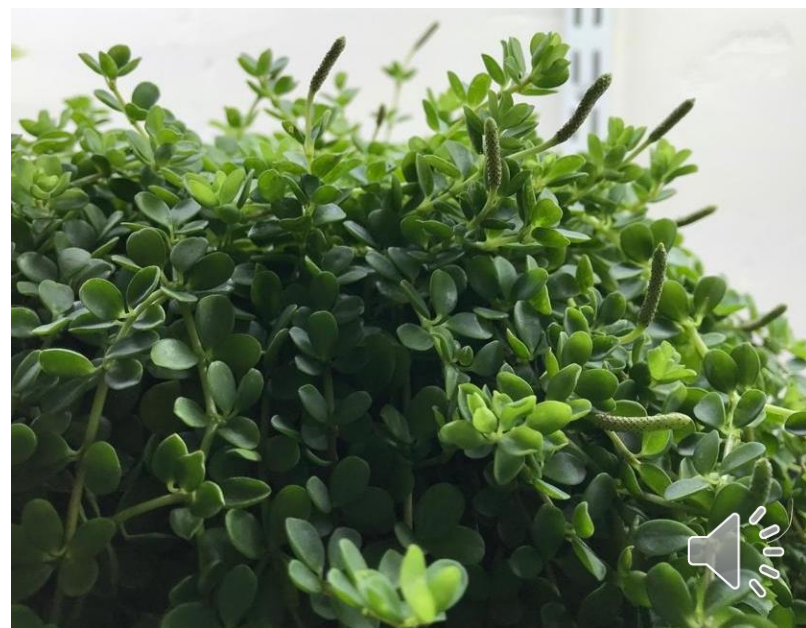
*Fenestratae Peperomia*















Thank you all for your attention

And to  
Professor Andrew Fleming  
Dr Lisa Smith  
Dr Heather Walker  
Everyone in Lab D59 and Mass Spectrometry Lab at the University of Sheffield for  
their help in my research

