

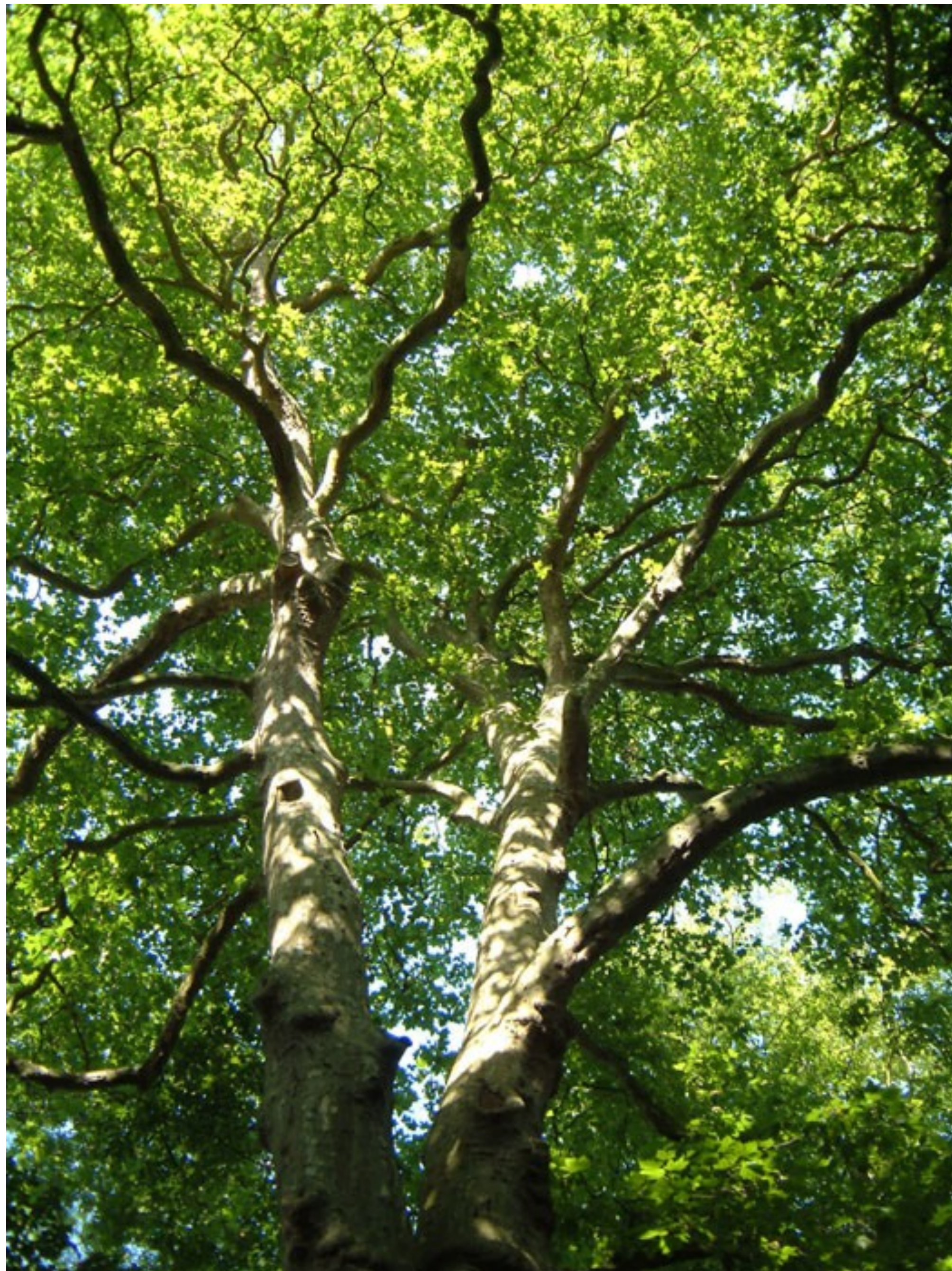


In desert regions where water is in short supply leaves are either small or have been dispensed with altogether in favour of photosynthetic stems. Additional adaptations include stem enlargement for water storage.

These adaptations are universal and are governed by the physics of evaporation. A small surface area to volume ratio is advantageous in limiting evaporation.

Because this represents a general “engineering solution” to the problem of water loss similar morphologies have evolved in similar environments independent of taxonomic affiliations.





In environments where water supply is not limiting a much larger leaf surface area can be supported without desiccation. Leaf area indices (total leaf area/unit area of ground surface) > 12 can be observed in rain forests. Individual leaf size range can be large.

However leaves also reflect the local microclimate: leaves at the top of the tree crown are exposed to high insolation and wind speeds so are smaller and thicker than leaves in the darker, more humid, understory.