

**LEAF ADAPTABILITY OF TWO NON-TIMBER FOREST SPECIES *Caryota urens* L. AND *Elettaria cardamomum* VAR. MAJOR PLANTED IN THE *Pinus caribaea* ENRICHMENT BUFFER ZONE IN SINHARAJA MAB RESERVE, SRI LANKA**

H M V T Welagama, K U Tennakoon, C V S Gunatilleke,  
I A U N Gunatilleke and R M M Bandara  
Department of Botany, University of Peradeniya

*Caryota urens* L. and *Elettaria cardamomum* var. *major* are indigenous non-timber species which are used as market or sustainable goods and services for human or industrial consumption. Both species thrive well in disturbed forest areas in the south-western part of Sri Lanka. Being understory species, the growth of these species are affected by sun light which is highly variable and often limiting resource in the forest.

In a *Pinus* enrichment study established in 1991, leaf anatomical adaptability of these two species after 12 years of initial establishment under the *Pinus* buffer zone of the Sinharaja MAB reserve was investigated. Different light levels in the study area were created by thinning *Pinus* trees at different densities.

Lower epidermis of *C. urens* showed highest (7.75 %) and lowest (6.35 %) stomatal indices in 2 pine rows removed treatment (2R) and 5 pine rows removed treatment (5R) respectively. Corresponding values for *E. cardamomum* were 6.00 % (highest) in the closed canopy control (CU) and 5.22 % (lowest) in 1 pine row removed treatment (1R).

The highest thickness of *C. urens* leaf cuticle ( $0.26\mu \pm 0.02$ ), leaf blade ( $22.27\mu \pm 2.14$ ), upper epidermis ( $1.75\mu \pm 0.10$ ), lower epidermis ( $1.83\mu \pm 0.06$ ), palisade layer ( $6.25\mu \pm 0.87$ ) and spongy mesophyll layer ( $11.74\mu \pm 1.30$ ) were observed in 5R treatment that received relatively high light levels than other treatments.

*E. cardamomum* leaves showed highest thickness of leaf blade ( $22.43\mu \pm 0.88$ ), lower epidermal layer ( $2.12\mu \pm 0.11$ ), spongy mesophyll layer ( $10.32\mu \pm 0.57$ ) in 3 pine rows removed treatment (3R). The highest cuticle thickness ( $0.23\mu \pm 0.01$ ) was recorded in 3 pine rows under planting treatment (3U) while 1R treatment showed highest upper epidermal layer thickness of  $2.21\mu \pm 0.15$ . Palisade layer was highest ( $4.74\mu \pm 0.55$ ) in CU.

Results revealed that *C. urens* shows leaf adaptability to grow under relatively high sun light levels (5R treatment) while *E. cardamomum* shows most of the leaf adaptability characters to grow under moderate light levels (3R treatment).

The knowledge gained by this study is useful to recommend the optimum light requirements in terms of leaf anatomical traits of the study species.