D-10: Reproductive biology leaf area index and stomatal index of Family Cucurbitaceae - four species

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The family Cucurbitaceae is an economically important family as a source of food and income generation for farmers. In this study, 20 plants in each species of *Benincasa hispida, Luffa acutangula, Cucumis melo, Citrullus lanatus* were grown in the field at Peradeniya. Necessary growth requirements were supplied in the same manner to all plants.

Investigation of the reproductive biology of the 4 species included observations on (1) Morphology of the inflorescence and flowers. (2) Diurnal animal visitors to flowers. (3) Control pollination experiments.

To determine Leaf Area Index (L.A.I.) and stomatal index the following

equations were used:

$$\text{L.A.I.} = \frac{\text{Total leaf area of a species in the given land area}}{\text{given land area}}$$

$$\text{Stomatal index} = \frac{\text{No. of stomata per microscopic object}}{\text{No. of stomata + No. of epidermal cells per microscopic object}} \times 100$$

Hand pollinations experiments showed the absence of apomixis in the 4 species. Both self and cross-pollination treatments, set-fruit in the 4 species at more or less similar frequencies. The low fruit set in open pollinated treatments in *C. melo* and *C. lanatus* may be due to the failure of natural pollinators visiting small flowers of these 2 species. In *B. hispida* and *L. acutangula*, a higher fruit-set was recorded in open flowers, possibly because they had large sized flowers and long peduncles when compared to *C. melo* and *C. lanatus*.

L. acutangula showed higher L.A.I. values than the other 3 species. As L.A.I. is one parameter to determine photosynthesis efficiency, *L. acutangula* may have a high photosynthetic efficiency compared to the other 3 species. When considering stomatal index, *L. acutangula* showed a low value compared to the other 3 species. A low stomatal index value indicates high drought resistance. Stomatal index is only one parameter in determining drought resistance.