D-03: A study of morphological diversity of leaves of trees in Sinharaja forest

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Diversity of leaf morphology of plants is one aspect of biodiversity. Morphological variations of leaves have been viewed as environmentally induced modifications and adaptations. Nevertheless, similarities of leaf morphology of unrelated plants assembled in a particular tropical habitat have been reported and inferred as convergent evaluation of leaf morphology.

The present study attempts to find the following aspects of leaf morphology of trees in Sinharaja forest:

(i) Diversity of leaf morphology with reference to lamina shapes, apexe, bases, margins and petioles:
(ii) Dominant morphological types of the above parameters.

Observations were taken from trees randomly located in the northern part of Sinharaja forest: around Kudawa Research Station and along nature trails - Waturawa and Mulawela. Twigs were collected, as far as possible during field visits, from trees, and all were botanically identified. Data were compiled observing fresh leaves, and their different types of leaf shapes, apexes, bases and margins were recorded using standard taxonomic terms. Also the occurrence of petiole was noted.

During the survey 167 species of trees belonging to 37 families were observed. The leaf morphological types encountered were:

(i) *Leaf shapes*: lanceolate (62 spp.), elliptic (57 spp.), oblanceolate (20 spp.), oblong (12 spp.), oval (6 spp.), obovate (3 spp.) cordate (2 spp.) peltate (2 spp.),ensiform (1 sp.), spatulate (1 spp.) and orbicular (1 sp.).

(ii) *Apexes*: cuspidate (56 spp.), mucronate (43 spp.), aristate (16 spp.), caudate (12 spp.), cirrhose (10 spp.), obtuse (8 spp.), mucronulate (7 spp.), retuse (4 spp.), rounded (3 spp.), apiculate (3 spp.), acuminate (2 spp.), acute (1 sp.), emarginate (1 sp.) and obcordate (1sp.).

(iii) *Bases*: attenuate (90 spp.), rounded (38 spp.), acute (17 spp.), truncate (11 spp.), cuneate (7 spp.), cordate (2 spp.), peltatus (1 sp.) and oblique (1 sp.).

(iv) *Margins*: entire (146 spp.), crenate (9 spp.), sinuate (6 spp.), serrulate (3 spp.), serrate (2 spp.) and dentate (1 sp.), and

(v) 163 species had petioles and 4 species were sessile. Hence, the first 3 leading morphological types of the leaf parts are, in descending order of dominance, as follows:

Shape: lancelate;37.1% > elliptic; 34.1% > oblanceolate; 11.9%
Margin: entire;87.4% > crenate;5.3% > sinuate; 3.5%
Base: attenuate;53.8% > rounded;22.7% > acute; 10.1%
Apex: cuspidate;33.5% > mucronate;25.7% > aristate;9.5%
Petioles: petiolate;97.0% > sessile; 3.0%

In conclusion, the diversity of leaf morphology of tree flora in Sinharaja is significantly high as testified by 11 types of leaf shapes, 14 types of apexes, 8 types of leaf bases and 6 types of leaf margins recorded in 167 species. The dominant morphological types *viz*. lanceolate shape, entire margin, attenuate base and cuspidate apex, are presumably indicative of convergent evolution of structural features to produce leaves that facilitate draining of water more effectively.