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Dermal anatomy of two interesting corticolous orchids from the Western Ghats

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Abstract
Present paper deal with study on dermal anatomy of two ineresting corticolous orchids viz. Cymbidium aloifolium Swartz and *Luisia birchea* (A. Rich). Bl from Western Ghats. In present study it has been observed that stomata in both the orchids are of paracytic type. Stomata are mostly flushed with the epidermis as is true in majority of orchids. Hypostomatic condition has been observed in both the orchids[7].

The orchids are the most beautiful flowering plants. They are well studied and represented in India. Kaushik[2] has considered the taxonomic significance of stomatal features and classified the orchids into four groups, anomocyticeae, diacyticeae, cyclocyticeae and paracyticeae. Taxonomic importance of stomata was indicated by Mohana Rao and Khasim6. Mehra3 highlighted phylogenetic significance of stomatal character in orchids. Dermal anatomy of western Himalayan orchids was studied by Vij and Kaur[9]. In this attempt, stomatal characters and related features of leaf epidermis has been studied into two corticolous orchids viz. Cymbidium aloifolium Swartz, and *Luisia birchea* (A. Rich.) Bl.

Material related to the study of stomata was studied by peeling method of leaves.

Mature leaves were used to study the dermal characters. The method suggested for grasses by Metcalfe4 and for orchids by Williams[10] was adopted in present investigation. The leaves were scrapped until only the epidermis remained. The epidermis was mounted in mounting medium (glycerine and alcohol, 1 :1) The measurements were made with the help of a standardized micrometer. Scale was calculated with the help of ocular and stage micrometer. Drawings were made with the help of a camera lucida. Stomatal Index was calculated by adopting standard formula.

Enumeration of species :

1. *Cymbidium aloifolium Swartz.*

A beautiful species of epiphytic orchids growing along western Ghats. It has short pseudo-bulb, leaves obliquely notched at the apex, slightly expanded at the base, flowers yellowish-red in drooping racemes.

Leaves : 4-9, sessile, spreading, leathery, linear, oblong, obtuse, slightly and obliquely notched at the apex, 30 - 45 cm x 2-2.6 cm, hypostomatic.

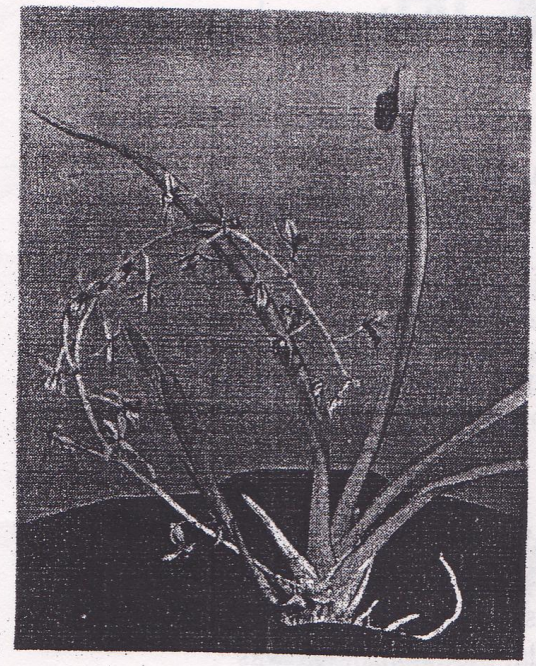
Epidermis : Cells polygonal with thin and non-sinuous walls (24.6-41 μ x 24.6 μ), trichomes absent; stomata flushed, paracytic, elliptical, 28.7 μ x 12.3μ guard cells kidney

shaped and longitudinally placed, stomatal opening 12.3μ x 4.1 μ.

Stomatal frequency : 21.62 / mm²

Stomatal index : .015

PLATE-I



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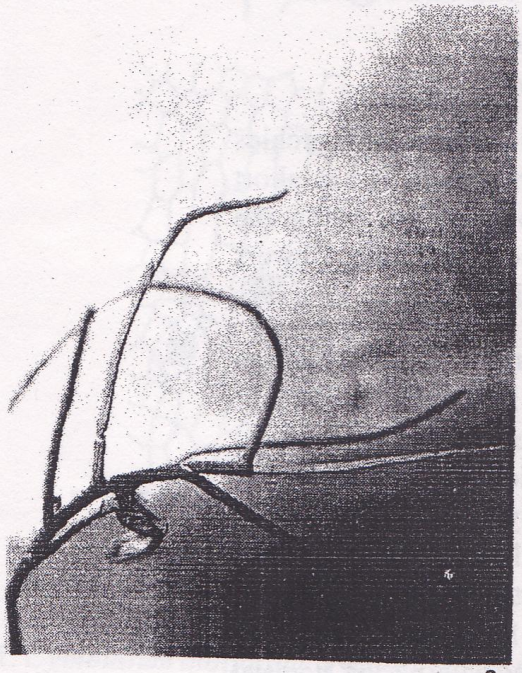

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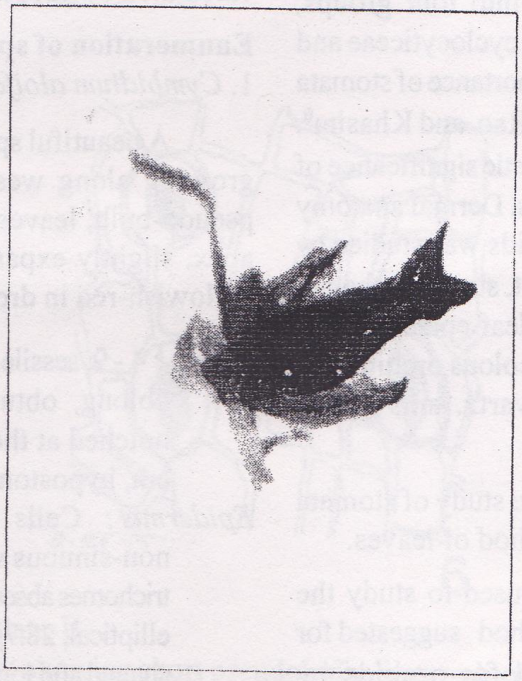

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Plate-I.

1. *Cymbidium aloifolium* Swartz., Habit of the plant.
2. Enlarged view of a flower.
3. *Luisia birchea* (A. Rich.) Bl. Habit of the plant.
4. Enlarged view of a flower.

2. *Luisia birchea* (A. Rich.) Bl.

This epiphytic orchid is common along the western Ghats at an altitude of 900 m. Occurs in tufts on tree-trunks. Stem is 20-40 cm high, 3-5 mm thick, stout almost uniformly so from base to tip, dark brown with green shade, inflorescence is extra-axillary. A single flower faces downward.

Leaves : 6-10 in number, cylindrical, leaves are 8-9 cm x 4 cm variable in thickness, light or dark green spreading or ascending, straight tailed at apex, hypostomatic.

Epidermis : Cells rectangular, non-sinuous, 36.9-65.6 μ x 24.6 - 28.7 μ, trichomes absent, stomata flushed, paracytic, elliptic, 49.2μ x 12.3 μ, kidney shaped, longitudinally placed, pore size, 24.6 μ x 8.2 μ

Stomatal frequency : 37.3 /mm^2

Stomatal index : 046

The character of epidermal cells can be considered as a parameter in taxonomy of the orchids. They were very large in *Luisia birchea* (A. Rich.) Bl. (36.9-65.6 μ x 24.6-28.7 μ). The epidermal cells were small in Cymbidium aloifolium Swartz. (24.6 - 41 μ x 24.6μ). Epidermal cells were polygonal, thin with non-sinuous walls. Mohana Rao and Khasim6 observed some thin walled and hyaline 'water storage cells' on adaxial side of some species of orchids, such structures were not observed on adaxial surface of two corticolous orchids under investigation. Hypostomatic condition has been observed in Cymbidium aloifolium Swartz and *Luisia birchea* (A. Rich) Bl. The leaves are similarly hypostomatic in most of the orhids1,5,8,11. The stomata were mostly flushed with the epidermis as is ture in majority of orchids7. The stomatal frequency has been ranging between 21.62-37.3/mm^2. Stomata in both the corticolus orchids were of paracytic type.

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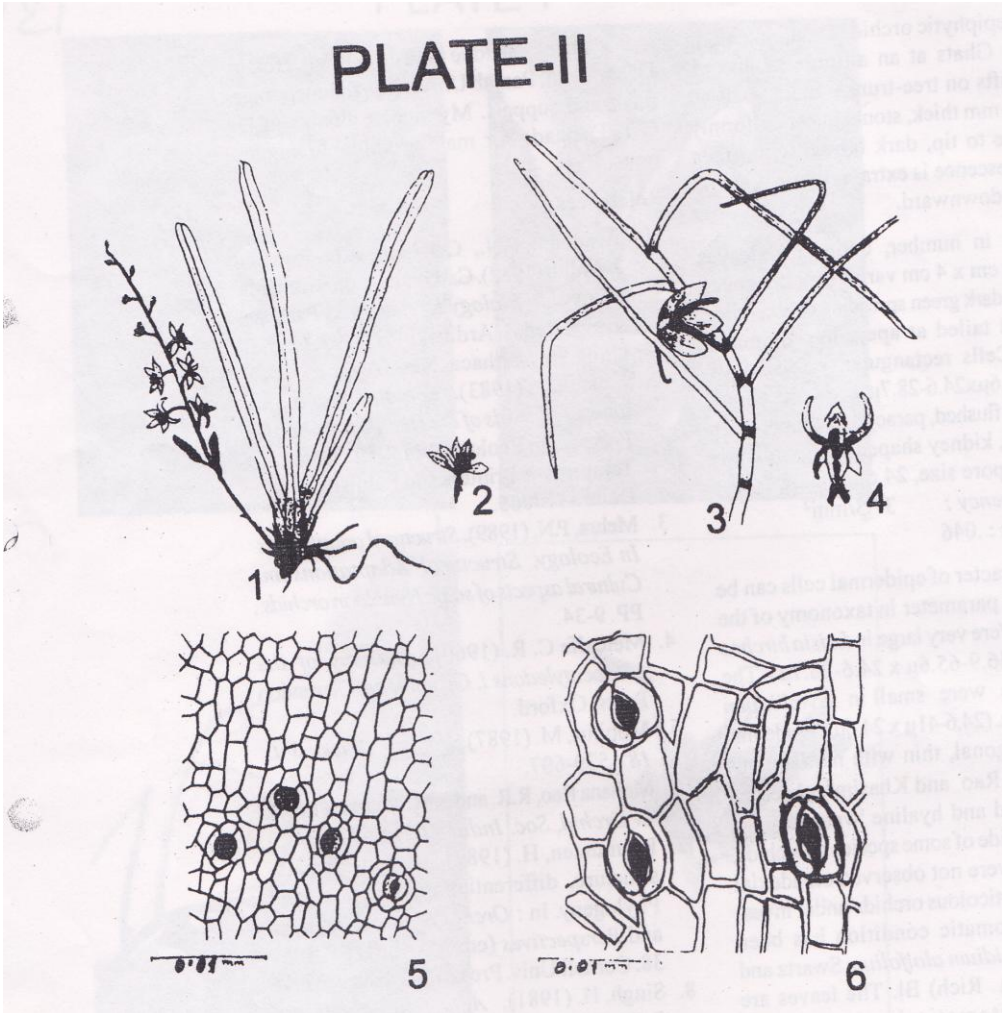
PLATE – II



1. *Cymbidium aloifolium* Swartz., Entire plant showing short psudobulb, linear- oblong leaves and inflorescence. 2. Enlarged view of a flower. 3. *Luisia birchea* A Rich). Bl. Entire plant with stem showing prominent internodes, ascending terete leaves and solitary, extra axillary inflorescence. 4. Enlarged view of a flower. 5. *Cymbidium aloifolium* Swartz. Abaxial side of a leaf (X 450). 6. *Luisia birchea* (A. Rich). Bl. Abaxial side of a leaf (X 450).